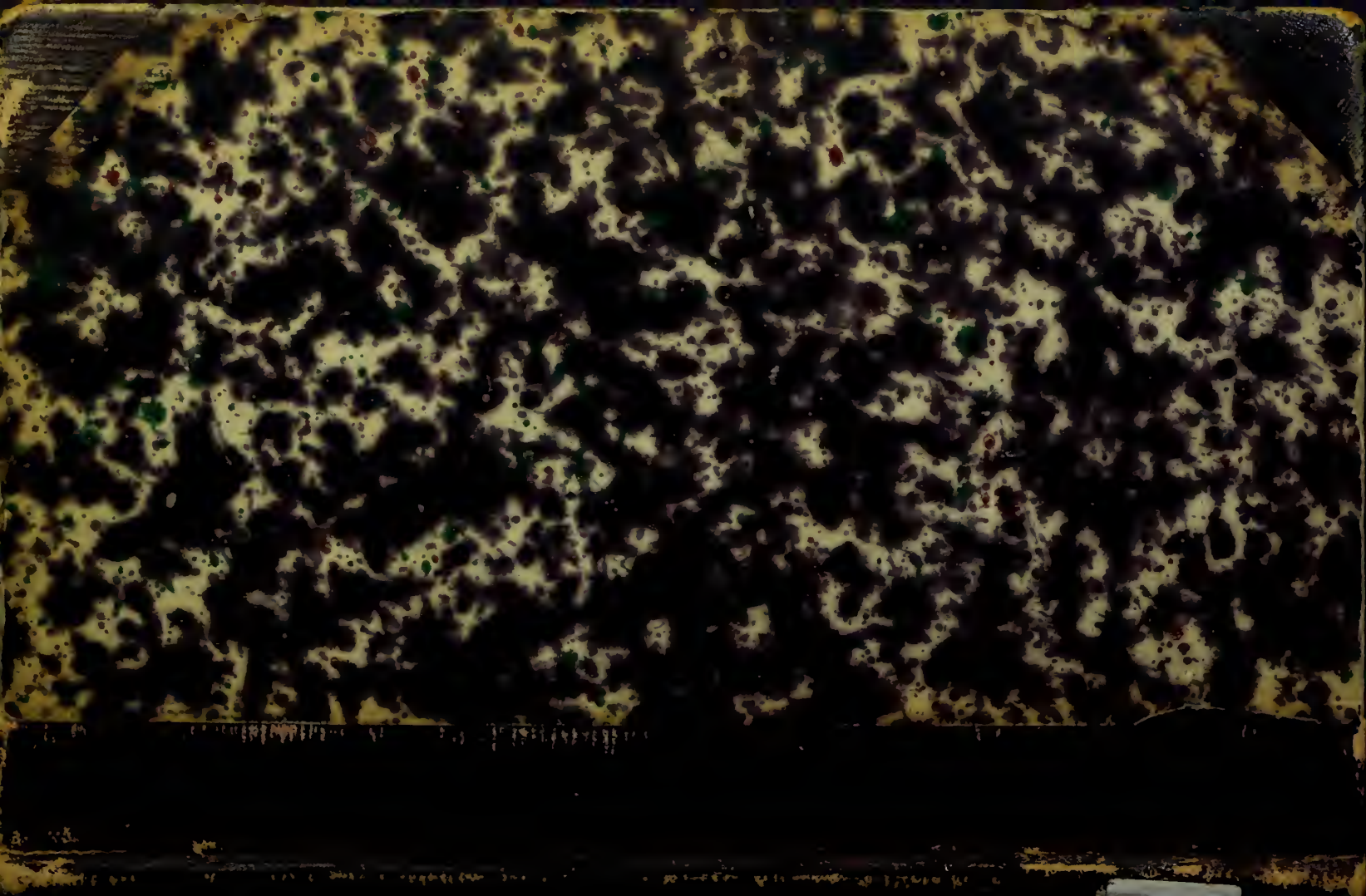

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THE

CALIFORNIA TEACHER.

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[*For the California Teacher.*]

BOTANY FOR SCHOOLS.

Beginning with this number, we shall publish a series of illustrated articles, well calculated to serve as an introduction to the systematic study of Botany. The illustrations, as well as the language used here, are, in the main, taken from Dr. John Lindley's Letters on Botany to a Lady. The method pursued by this distinguished botanist, about forty years ago, is essentially the same as now generally followed by great and distinguished educators. According to this method only a limited number of plants are studied, and but few technical terms are introduced. Agassiz, referring to this method in his "Methods of Study of Natural History," says the following: "The truth is, that to study a vast number of species without tracing the principles that combine them under more comprehensive groups, is only to burden the mind with disconnected facts, and more may be learned by a faithful and careful comparison of a few species than by a more cursory examination of a greater number. When one considers the immense number of species already known, naturalists might well despair of becoming acquainted with them all were they not constructed on a few fundamental patterns, so that the study of one species teaches us a great deal for all the rest. De Candolle, who was, at the

same time a great botanist and a great teacher, said that he could undertake to illustrate the fundamental principles of his science with the aid of a dozen plants, judiciously selected, and that it was his unvarying practice to induce students to make a thorough study of a few minor groups of plants, in all their relations to one another, rather than to attempt to gain a superficial acquaintance with a large number of species."

The most discouraging parts of Botany to the new beginner consist either in the numerous new and strange names one has to learn the meaning of, or in the minuteness of the parts by which plants are distinguished from each other, or in the great multitude of species of which the vegetable kingdom consists; and it must be confessed that there is something seriously alarming in the mass of preliminary knowledge which it would appear has to be acquired before any perceptible progress can be made.

But if we look at the subject a little more closely we shall find that of the technical terms employed only a small number is really necessary in the beginning; that minute parts are little consulted in practice, however much they may be in theory; and that in consequence of the perfect arrangements of botanists, no more inconvenience is experienced from the number of species than in any other branch of natural history.

There are certain terms, the exact meaning of which *must* be understood, and which cannot be dispensed with if the science is to be studied to any good purpose; a sort of habit of observation has also to be acquired, without which the differences between one plant and another can never be appreciated or remembered; but these things may be gained imperceptibly and without any extraordinary exertion, either of industry or patience. We have only to begin with the beginning, and never to take one step till that which precedes it is secured; afterwards the student may advance to what point he pleases. This appears to us the only secret in teaching Botany.

We must, however, be careful while we attempt to strip the study of its difficulties, that we do not also divest it of its interest, and imitate those who, by the ingenious substitution of words for ideas, have contrived to convert one of the most curious and interesting of all sciences into a meager and aimless system of names.

In strict accordance with this method, we proceed now to consider the floral parts of the Buttercup, and their relative position on the receptacle.

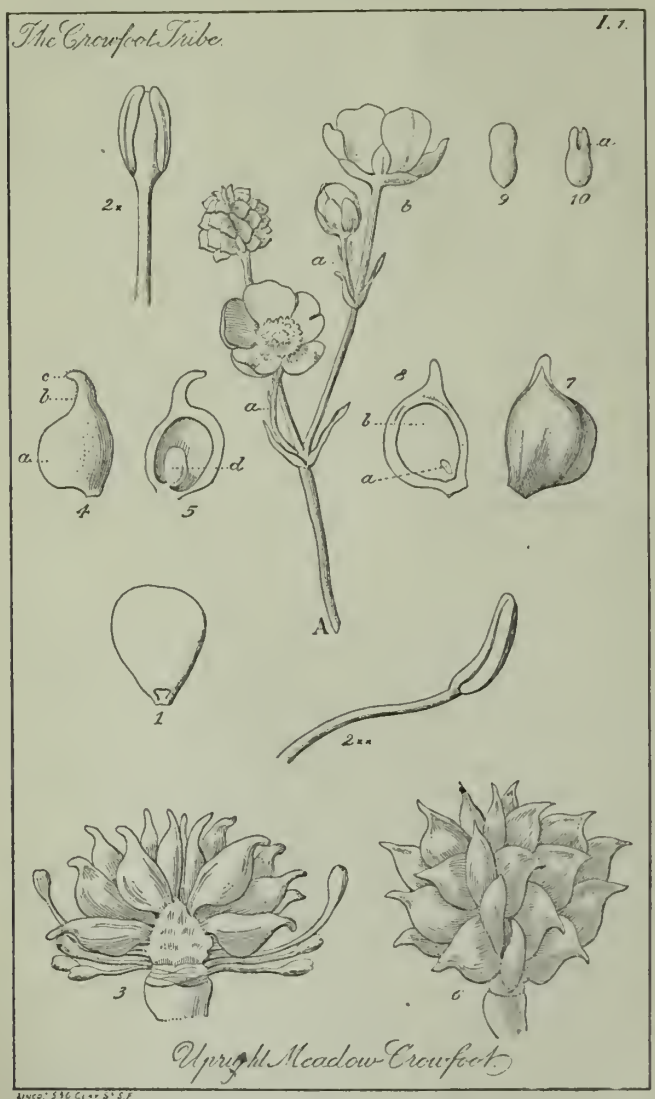
You need not be told that plants have generally five very distinct parts, viz: ROOT, STEM, LEAF, FLOWER and FRUIT. The application of the three first of these terms is already well known to you; the last is applied by botanists not only to such objects as apples, pears, cherries, and the like, but also to any part which contains the seed, so that the grains of corn, the heads of poppy, the nuts of the filbert, and even the little bodies which are commonly called caraways, are all different kinds of fruit.

It is in the flower that the beauty of plants chiefly resides. It is there that we find all the curious apparatus by means of which they are perpetuated, and it is the spot where the greatest number of parts are found, the names of which are unusual and require to be remembered. To illustrate these, let us take a very common plant, to be found everywhere, by the learned called *Ranunculus,* by the layman, Buttercup, or Crowfoot.

On the outside of the flower of this plant, about the middle of its stalk, are one or two little leaves, which look like the other leaves, only they are a great deal smaller; indeed they are so small as to resemble scales. These are the BRACTS.

Next them, and forming the external part of the flower itself, are five small greenish-yellow hairy leaves (*a, b*), which are rather concave, and fall off shortly after the flower opens. Leaves of this sort form the CALYX, and are called SEPALS; they protect the more tender parts of the flower.

Next the sepals are placed five other leaves, which are much larger and of a bright, shining yellow. They stand up and form a little cup, in the bottom of which the other parts of the flower are curiously arranged. These five shining leaves form the COROLLA, and are called PETALS. Their business is, in part, to prepare the honey which exudes from a little scale you will find on their inside, near their base (fig. 1), and which, if secreted in sufficient quantity, is collected by bees for their sweet food; and it is, in part, to protect from injury the delicate organs which lie in their bosom. These last are of two sorts, as you will soon learn.



[For description of Plate see end of article.]

In a ring from which both the sepals and petals arise, you will find a number of thread-like yellow bodies, which are thicker at the top than at the bottom. They spread equally around the center as if they wished to avoid that part, and are a great deal shorter than the petals; we call them STAMENS. Their lower part, which looks like a thread, is called the FILAMENT; their upper thickened end is named the ANTHER. This last part is hollow, and will be found, if you watch it, to discharge a small quantity of yellow powder, called the POLLEN. The pollen has a highly curious office to perform.

Next to the stamens, and occupying the very center of the flower, are a number of little green grains, which look almost like green scales. They are collected in a heap, and are seated upon a small elevated receptacle (figs. 3 and 6); we call the whole collection of them the PISTIL, and each separate one a CARPEL. They are too small to be readily seen without a magnifying glass; but if they are examined in that way you will remark that each is roundish at the bottom, and gradually contracted into a kind of short, bent horn at the top; the rounded part (fig. 4, *a*) is the OVARY; the horn (*b*) is the STYLE; and the tip of the style (*c*), which is rather more shining and somewhat wider than the style itself, is named the STIGMA; so that a carpel consists of ovary, style and stigma. At first sight you may take the carpels to be solid, and fancy them to be young seeds; but in both opinions you would be mistaken. The ovary of each carpel is hollow (fig. 5), and contains a young seed called an OVULE (fig. 5, *d*), or little egg; so that the carpel, instead of being a seed, is the part that contains the seed.

Although the ovule is really the young seed, yet it is not always certain that it will grow into a seed; whether or not this happens depends upon the pollen, of which we have already spoken, falling upon the stigma. If the pollen does fall on the stigma, it sucks up the moisture it finds there, swells, and finally each of the minute grains, of which it consists, discharges a jet of matter upon the stigma, which fertilizes the ovule, and then the latter grows and becomes a seed. But if the pollen does not fall upon the stigma, then the ovule withers away, and no seed is produced. Thus you see every one of the parts of the flower is formed for some wise purpose.

You have now seen all the parts of which flowers usually

consist; the fruit is merely an alteration of the carpels, and the seed of the ovules. The fruit of the Buttercup is almost exactly the same when ripe as when young, except that its parts are larger, and it has become brown, dry and hard (fig. 6). Separate, at this period, one of the carpels from the remainder, and place it under a magnifying glass. The inside of the carpel is filled up with the seed now arrived at its perfect state; the shell of the carpel has become hard and thick, and not only effectually protects the seed from harm (fig. 8, *a*), but keeps it in the dark, another wise provision, for without darkness the seed could not grow. The shell thus altered is called the PERICARP.

If you cut the seed through, you will, for a long time, discover nothing but a solid mass of white flesh, in which all the portions seem to be alike; but if you happen to have divided it accurately, from top to bottom, cutting through both edges of the grain as at fig. 8, you will then be able to discover near the base of the seed a very minute oval body (fig. 8. *a*), which may be taken out of the flesh with the point of a needle. This oval body is a young plant—it is the part which grows when the seed germinates, and is named the EMBRYO; the fleshy matter that surrounds it, called ALBUMEN, is only intended to nourish the young and delicate embryo when it first swells and breaks through the shell. Small as is the embryo, so small as to be invisible to the naked eye, it also is constructed in a regular manner. It is not merely an oval, fleshy body, but it has two differently organized extremities, of which the one is divided into two lobes, called COTYLEDONS (fig. 10), or seed-leaves, and the other is undivided, and called RADICLE. The latter is the beginning of the root, as the former are the beginnings of leaves. Let the seed fall upon the earth; the embryo imbibes moisture, swells and shoots forth into a young plant.

Such is the structure of a perfect flower, and such the principal terms which you have to remember in order to understand the language of botanists.

By far the greater part of the characters which we have seen that the Buttercup possesses, will be also found in other and extremely different plants; but there are two characters which are what we call essential—that is to say, such as will

distinguish it and the other plants belonging to the same natural order from other natural orders resembling it. These essential characters are, *there being a great many stamens which arise from beneath the carpels*—which is what botanists term being hypogynous (Pl. I, fig. 3)—*and also several carpels which are not joined together.* If you will pay attention to these two circumstances you will always know a ranunculaceous plant—that is to say, a plant belonging to the Buttercup family.

The floral parts and their relative positions having been thoroughly mastered, the student may now proceed and compare with the Buttercup any species of Larkspur (*Delphinium*), Columbine (*Aquilegia*), Pæony (*Pæonia*) and Virgin-Bower (*Clematis*). In all cases the same relative position of the floral parts will be observed, though the peculiarly shaped petals of the Columbine and the odd-shaped sepals of the Larkspur may puzzle the student at first.

EXPLANATION OF PLATE I.—*A*, a twig of the upper part of the stem of a Buttercup or Crowfoot; *a a*, bracts; *b*, calyx; 1, a petal seen in the inside, with the scale at the base; 2*, An anther seen with a part of the filament, seen in front; 2**, the same more magnified, viewed sidewise; 3, the center of a flower cut through, the calyx and corolla being removed; the stamens are seen spreading outwards, with their filaments originating from underneath the carpels; the latter occupy the center, and are shown to arise from a short, conical central part, which is their receptacle; 4, one of the carpels; *a*, the ovarium; *b*, the style; *c*, the stigma; 5, the same carpel cut open so as to show the young seed, or ovule, *d*; 6, a cluster of ripe carpels, or grains; 7, one of the grains separate; compare this with fig. 4, on the opposite side of the plate; 8, the same grain cut in half, showing *a*, the young plant or embryo, and *b*, albumen or nutritive matter, stored up for feeding the young plant when it begins to grow; 9 is an embryo extracted from the albumen, and seen from the back; 10, the same seen from the side, so as to show the two minute seed-leaves or cotyledons, *a*. (N. B. —The principal part of these figures is more or less magnified.)

WE do not believe in the way that many teachers use in teaching the arithmetic, and still less do we believe in some of their requirements. Unless a scholar shall perform an example in accordance with the explanation, and then give the rule as it is in the book, it is all wrong. So is this method of teaching "all wrong." Scholars should be taught dependence upon themselves. That there is a *way*, not a *rule*, for working an example, and all they need to know is the way, and they can make a rule for all similar examples.—*Maine Journal of Education.*

PEEPS THROUGH THE DOOR OF A KINDERGARTEN. NO. IV.

I found the children of the Kindergarten in a pleasant bustle of preparation for the coming holidays, when I went into the room yesterday morning. The spirit of Christmas seemed to have taken possession of each little child, and eager fingers, grown skillful through much exercise in Kindergarten occupations, fairly flew at the pretty work.

At one table the little ones were perforating. The teacher passed to each a soft cushion and a perforating tool. The square portfolios came next—bright envelopes, with the owner's name in large letters upon the outside. The bright eyes watched the package in the teacher's hand, and I was surprised to notice that each knew his own name though the letters were *written*, and the children were all under six years of age. The teacher explained this marvel to me by saying:

"O yes, they all know their names; they look at them so much that many of them can write them. When they go into the next department they will be taught to write, at the same time that they are taught to read."

The portfolios were placed in the right hand corner of the square, the idea of order being never lost sight of for a moment in this "paradise."

When Miss J. began to count, the work was quickly taken out, the mat or cushion placed with the greatest precision in front of the child, and the busy little fingers were at work. The pattern to be perforated is drawn upon very thin paper, which is then gummed to a piece of bristol board, and the child, with a tool, makes little pricks along the lines. A very pleasant murmur of voices kept time to the funny sound of the needles, but the children never pause in their task. Each seemed intent upon doing as much as possible during the appointed time. Not a look of weariness did I see on any face, but all were interested and happy. They talked about the different animals, flowers, plants, insects and figures drawn upon their papers, and compared notes; occasionally their kind teacher told bits of stories about this or that picture. In this way many little lessons in Natural History, Botany and Philosophy were given.

"Now," said Miss J., "I must come around and look at your work."

Those who had done well she encouraged, those who had been careless she helped and smiled upon, and these were incited to fresh effort. She told me that the occupation of perforating immediately preceded drawing and writing, and said it was most wonderful, but true, that the hand grew steady in a short space of time, when exercised in this work. A bright little girl, hearing her last remark, paused, with needle half raised, and exclaimed:

"Oh, my grandpa needs perforating *dreadfully;* his hand is so unsteady that sometimes he spills his coffee."

The older children had cards instead of cushions, and finer tools; and much of their work was "pricked full," that is, certain portions filled with small holes, which had the effect of raising the work, and this was very showy and beautiful.

But the finest of all was that done by the children at Miss Hamilton's table, some specimens of which Miss J. took from a glass case to show me. These were perforated very full, and afterwards colored with crayons or paints. There were birds of many hues, flowers and green leaves, patterns for embroidery, and—I cannot tell what more—but they were really works of art in themselves. It was funny to hear a little voice ask, now and then: "Shall I perforate the dog's tail now, Miss J.?" or "Shall I put in the boy's eyes next?"

They were always turning their cards to get the effect of their work, and fancying resemblances to something, as "Oh, Mamie, just look at mine! There's a figure II on the horse's back!" or "Jennie, Jennie! look quick at my figure two, and there is a right-angled triangle."

One little boy had a tiger, and asked all sorts of questions about it, which were cheerfully answered by the teacher. He seemed to be trying to recall something, and at last he exclaimed: "Oh, I know now—I saw one a great many years ago in Central Park (he was not quite five), and I remember he looked fierce just like this one."

The sound of a bell was heard and the little ones, with many an audible sigh, put away the pretty cards, and went out for recess, which I heard one little thing wish, as she went past me, *would not come so soon!*

Entertaining study seldom tires.—*Rural Home.*

JOHNNIE MAKES DISCOVERIES IN EYES.

By Adam Stwin.

"Do you know," said Johnnie, the other day, with that troubled look on his face which he always wears when wrestling with an idea a little too large for him, "Do you *know* . . . that pussy can . . . shut her eyes tight . . . when they're wide open?"

Johnnie had just been made happy by the gift of a pretty black and white kitten, whose playful tricks and cat-like ways are something new to him. It was plain enough what he wanted to make out, but I thought it best not to answer his questions directly, so I said:

"You mean that pussy winks, don't you?"

"No, not that," said Johnny positively. "Pussy winks, but this is inside the winking, and its different."

"How different?"

Johnnie was puzzled. He sat awhile, knitting his brows with the hard work his little brain was trying to do; then he brightened up and said:

"This is different. It isn't up and down, like winking, but the other way—like the parlor doors, you know, when they slide together. I'll get pussy and show you."

While Johnnie was away hunting for the kitten his brother Fred came in, followed by Humpty Dumpty, his little mischief-loving Skye-terrier.

"Wait a moment, Fred," I said, as the two were hurrying through to another part of the house, "I shall want Humpty in a minute or so. There's Johnnie's voice; please open the door for him."

Fred opened the door, and Johnnie came in with the kitten, crying, as the dog sprang to meet him, "Go 'way! Humpty! Go 'way! You frightened pussy. Make him be still, Fred. There, pussy, there! don't be scared, he sha'n't hurt you." And so he brought her to me, stroking her back and smoothing her ruffled tail to quiet her. "Maybe she won't do it now," he said, "she's so scared, but she did it ever so many times today. She'd look right at me and shut her eyes up *tight*, without winking a bit."

"Turn her face to the window," I suggested, when Johnnie began to despair of making me see what he had noticed.

"There, there!" he fairly shouted, as the kitten faced the light, "See, she does it now! What makes her?"

"What made you draw the curtain a little while ago when you were playing by the window?"

"Why, the sun was so bright it hurt my eyes."

"And if it had been necessary to shut out still more light you'd have asked some one to close the blinds also, wouldn't you?"

"I suppose so," said Johnnie, wondering what that had to do with pussy's eyes.

"I think I've seen you do something of that sort yourself," I said, "without calling on any one to help you."

"Have you?" asked Johnnie doubtfully. "When?"

"Every day. Look toward the sun," I continued, raising the curtain a little. "What makes you scowl and blink so?"

"It's so bright," said Johnnie, "it hurts."

"So you close the shutters a little," I suggested, "to shut out part of the light."

Johnnie put his hands to his eyes, winked, felt the eyelids move two or three times, then exclaimed: "I never noticed that before! They're real shutters, are'nt they?"

"That's part of their use," I said. "And see, pussy has them, and so has Humpty Dumpty."

"But that isn't what *I* meant," said Johnnie, earnestly. "It was pussy's inside winking."

"I know," said I. "We'll come to that directly. Now look at my eye closely. Do you see a round, black spot in it?"

"Yes," said Johnnie.

"That's the window of my eye—that's the part I look through."

"Is it?" said Johnnie.

"Yes," I repeated. "That's the real window of the eye. Now watch it while I turn my face to the light; then when I shade my eyes with my hands. Do you see anything?"

"What tiny little sashes there are!" exclaimed Johnnie.

"In my eye?"

"Yes," said Johnnie. "I could see them when you looked to the light."

"Oh no," said I. "That's just the reflection of the window sash, like this," and I showed him how the window was reflected in my eye-glass when I held it toward the window and before a dark place. "I didn't mean that. Look again."

"Do you mean the little black spot that keeps changing?"

"The very thing," said I. "Do you see it grow small when I look to the light, then big again when I look away?"

"Yes," said Johnnie.

"Now look at pussy's eyes. Is there anything like it there?"

"The dark spot doesn't grow smaller; it shuts up like a book," said Johnnie. "That's what I asked you about."

"Pussy has a different way of drawing her eye-curtains, that's all," said I.

"Oho!" said Johnnie. "Shutters outside and curtains inside, just like a real window. That's funny! Have you got 'em too, Humpty?"

Humpty came out from under the table, wagging his tail, as much as to say he'd like to answer the question if he only understood it; he'd try, anyhow, if there was any fun in it.

"Let's see those pretty brown eyes of yours," said Johnnie, taking Humpty by the ears and turning his face to the window.

"Humpty's eyes are just like yours," he went on, "and not a bit like pussy's."

"Yours are the same, too," I said.

"Are they? And Fred's?"

"Look and see."

Johnnie looked at Fred's eyes, then at his own in a glass, and said: "How queer! I don't know how I do it."

"But you see it is done whether you understand it or not. Too much light hurts the eye, so there's a number of little servants, called nerves and muscles, stationed there, who draw the curtains without waiting for any orders from you. By and by, when you are older, you'll learn all about them. At present it is enough for you to study the different sorts of curtains there are in different kinds of eyes."

"Are there more kinds than I have seen?" asked Johnnie.

"One more, at least," said I. "If it's pleasant to-morrow perhaps Fred will take you to Central Park, where you can see for yourself. If you go, you must remember and tell me the names of all the animals that have eyes like Humpty's, and

those that have eyes like pussy's, and any other kind you may see; then we'll have another talk about them."—*Christian Union.*

IN THE LABORATORY WITH AGASSIZ.

More than fifteen years ago I entered the laboratory of Professor Agassiz, and told him I had enrolled my name in the Scientific School as a student of natural history. He asked me a few questions about my object in coming, my antecedents generally, the mode in which I afterwards proposed to use the knowledge I might acquire, and, finally, whether I wished to study any special branch. To the latter I replied that while I wished to be well grounded in all departments of zoology, I puposed to devote myself specially to insects.

"When do you wish to begin?" he asked.

"Now," I replied.

This seemed to please him, and, with an energetic "Very well," he reached from a shelf a huge jar of specimens in yellow alcohol.

"Take this *fish*," said he, "and look at it; we call it a Hæmulon; by and by I will ask what you have seen."

With that he left me, but in a moment returned with explicit instructions as to the care of the object entrusted to me.

"No man is fit to be a naturalist," said he, "who does not know how to take care of specimens."

I was to keep the fish before me in a tin tray, and occasionally moisten the surface with alcohol from the jar, always taking care to replace the stopper tightly. Those were not the days of ground glass stoppers and elegantly shaped exhibition jars. All the old students will recall the huge neckless glass bottles, with their leaky, wax-besmeared corks, half eaten by insects and begrimed with cellar dust. Entomology was a cleaner science than Ichthyology, but the example of the professor who had unhesitatingly plunged to the bottom of the jar to produce the fish, was infectious; and though this alcohol had "a very ancient and fish-like smell," I really dared not show any aversion within these sacred precincts, and treated the alcohol as though it were pure water. Still I was conscious of

a passing feeling of disappointment, for gazing at a fish did not commend itself to an ardent entomologist. My friends at home, too, were annoyed when they discovered that no amount of eau de cologne would drown the perfume which haunted me like a shadow.

In ten minutes I had seen all that could be seen in that fish, and started in search of the professor, who had, however, left the museum; and when I returned, after lingering over some of the odd animals stored in the upper apartment, my specimen was dry all over. I dashed the fluid over the fish as if to resuscitate the beast from a fainting fit, and looked with anxiety for a return of the normal, sloppy appearance. This little excitement over, nothing was to be done but return to a steadfast gaze at my mute companion. Half an hour passed, an hour, another hour; the fish began to look loathsome. I turned it over and around; looked it in the face—ghastly; from behind, beneath, above, sideways, at a three-quarters' view—just as ghastly. I was in despair; at an early hour I concluded that lunch was necessary; so, with infinite relief, the fish was carefully replaced in the jar, and for an hour I was free.

On my return I learned that Professor Agassiz had been at the museum, but had gone, and would not return for several hours. My fellow-students were too busy to be disturbed by continued conversation. Slowly I drew forth that hideous fish, and, with a feeling of desperation, again looked at it. I might not use a magnifying glass; instruments of all kinds were interdicted. My two hands, my two eyes, and the fish; it seemed a most limited field. I pushed my finger down its throat to feel how sharp the teeth were. I began to count the scales in the different rows, until I was convinced that that was nonsense. At last a happy thought struck me—I would draw the fish; and now, with surprise, I began to discover new features in the creature. Just then the professor returned.

"That is right," said he; "a pencil is one of the best of eyes. I am glad to notice, too, that you keep your specimens wet and your bottle corked."

With these encouraging words, he added:

"Well, what is it like?"

He listened attentively to my brief rehearsal of the structure of parts whose names were still unknown to me; the fringed

gill-arches and movable operculum; the pores of the head, fleshy lips and lidless eyes; the lateral line, the spinous fins and forked tail; the compressed and arched body. When I had finished he waited, as if expecting more, and then, with an air of disappointment:

"You have not looked very carefully; why," he continued, more earnestly, "you haven't even seen one of the most conspicuous features of the animal, which is as plainly before your eyes as the fish itself; look again, look again!" and he left me to my misery.

I was piqued; I was mortified. Still more of that wretched fish! But now I set myself to my task with a will, and discovered one new thing after another, until I saw how just the professor's criticism had been. The afternoon passed quickly, and when, towards its close, the professor inquired:

"Do you see it yet?"

"No," I replied; "I am certain I do not, but I see how little I saw before."

"That is next best," said he, earnestly, "but I won't hear now; put away your fish and go home; perhaps you will be ready with a better answer in the morning; I will examine you before you look at the fish."

This was disconcerting; not only must I think of my fish all night, studying, without the object before me, what this unknown but most visible feature might be; but also, without reviewing my new discoveries, I must give an exact account of them the next day. I had a bad memory; so I walked home by Charles River in a distracted state, with my two perplexities.

The cordial greeting of the professor, the next morning, was reassuring; here was a man who seemed to be quite as anxious as I that I should see for myself what he saw.

"Do you perhaps mean," I asked, "that the fish has symmetrical sides with paired organs?"

His thoroughly pleased "Of course, of course!" repaid the wakeful hours of the previous night. After he had discoursed most happily and enthusiastically—as he always did—upon the importance of this point, I ventured to ask what I should do next.

"Oh, look at your fish!" he said, and left me again to my own devices. In a little more than an hour he returned and heard my new catalogue.

"That is good, that is good," he repeated; "but that is not all; go on;" and so for three long days he placed that fish before my eyes, forbidding me to look at anything else, or to use any artificial aid. "Look, look, look," was his repeated injunction.

This was the best entomological lesson I ever had—a lesson whose influence has extended to the details of every subsequent study; a legacy the professor has left to me, as he left it to many others, of inestimable value, which we could not buy, with which we cannot part.—*By a former Pupil, in Every Saturday.*

GRAMMAR.

Grammar should be taught almost entirely through the reading lessons, and in this way, far from being the dry subject many have supposed it to be, it becomes one in which children take great interest. Any attempt, by giving them dry definitions of parts of speech and rules of grammar, is almost sure to fail; for one which it interests, it will disgust ten, and therefore the thing ought not to be attempted in this way. The most natural and easy manner seems to be, first:

Pointing out the distinction between vowels, consonants and dipthongs, from words in their lessons; when *a* or *an* is used before a noun; the difference between *a* table and *the* table; between a book and the book; a sheep and the sheep; a deer and the deer; whether they would say a house or an house; a hare or an hare; an heir, an hour—drawing attention to exceptions as they occur.

The next and easiest thing would be the nouns, pointing out all the things which they see around them, such as book, table, map, etc.; and thus they immediately know that the names of all visible substances are called nouns. This being once fixed, they are soon led to the idea that the names of things which they can imagine to exist, are nouns also; to distinguish the *singular* from the *plural;* that the singular means *one,* the plural more than one; the general rule of forming the plural by adding *s;* house, houses; map, maps, etc., the teacher taking care to point out the exceptions as they are met with in read-

ing, such as ox, oxen; tooth, teeth; man, men; loaf, loaves; church, churches; city, cities; and to observe also where anything like a general rule can be traced out, such as that nouns ending in *ch* soft make the plural by adding *es*, as church, churches; arch, arches; match, matches; while in *ch* hard they follow the general rule, as monarch, monarchs, etc.; in *sh*, as dish, dishes; fish, fishes, etc., adding *es;* in *f*, as leaf, loaf, changing *f* into *v*, and adding *es;* leaves, loaves; nouns ending in *y* into *ies*, as city, cities; fly, flies; why such words as boy, valley, do not follow the general rule. The difficulty of pronouncing *s* at the end of nouns ending in *ch, sh,* and *x,* show the reason for adding *es.*

The teacher would do well to exercise the children in forming the plural of any particular class of nouns as they occur; for instance, nouns ending in *f*, as leaf, spell it in the plural, leaves; potato, potatoes; negro, negroes; echo, echoes; and make them quote all the nouns ending in *f* and in *o* they could possibly recollect; the same way for others. This calls forth great emulation, and is attended with good results.

The difference of gender, also, in nouns ought to be pointed out.

They would now be able when sitting down, and without the assistance of a teacher, to pick out all the nouns in a lesson, writing them in columns in the singular and plural number; also, to write on their slates things of the following kind:

The names of the months of the year, and the number of days in each.

Of all the things in their houses and in their gardens; of all the tools used by the carpenter, such as plane, axe, chisel, etc.; by the blacksmith; of all the implements used in agriculture, or in their trades and occupations.

What are the names of all the tools made of iron used in the village?

The names of all the trees; of such vegetables as are food for man; for beasts, etc.; of all articles of home consumption, etc.; of the materials of which the houses are built, etc.; write the names of all the singing birds; of the birds of prey, etc.; write down six names of birds, all of which are compound words.

Being now able to point out the nouns, etc., they should advance to such words as qualify them—adjectives.

The teacher holding up an apple, for instance, will ask: Do all apples taste alike? No, sir; some are sour and some are sweet, bitter, etc. Do apples differ in any other way? Some are large and some are small—this is differing in size; some are red and some green—this is differing in color; some soft and some hard—this is differing in the quality of hardness; some are rounder than others—differing in shape; and all these words, expressing different qualities in the noun, are adjectives. Then, perhaps, they are told to sit down and write all the words they can think of which qualify the word apple, such as sour apple, sweet apple, large apple, etc.

Then to get the degrees of comparison: The teacher will observe the different sizes of the children, taking two of them out and making them stand side by side. When I say that this boy is taller than the one next to him, what am I comparing? The height of the two boys. This boy has got darker hair than the one next to him—the color of the hair: you have got cleaner hands than the boy next to you—the cleanness of my hands with the cleanness of his: such a child is the tallest in the class—is the best reader in the class. What do I compare? His or her height with the height of all the rest; his or her reading, etc. In this way, they will very soon understand what is meant by degrees of comparison, and should be told how to form them; tall, taller, tallest; great, greater, greatest, etc.; taking about half-a-dozen adjectives at a time, the children repeating them, and occasionally being set to write them on their slates. Reasoning in this way, the general rule soon strikes them, and the teacher must take care to point out the exceptions. Their very errors in following out a general rule are sometimes instructive as well as amusing; for instance, if you give them such a word as *little*, or *good*, they will immediately begin, good, gooder, goodest, following out the general principle; when all at once it flashes across them that the word is an exception, and the sort of knowing look they give you, as if you had tried to take them in, is most amusing.

In monosyllables, as *hot, hotter, hottest;* big, bigger, biggest, making them write down words which vary from the rule by doubling the final letter, and pointing out to them that this is the case with all words of one syllable ending in a consonant, with a vowel going before it.

The teacher should now begin to point out the pronouns as they occur—what particular nouns they stand for in a sentence—what case—whether they mark possession, etc.; for instance, when *I*, or *he*, or *she* occurs, to ask them what they make in the objective cases; what in the possessive. If *him*, or *them*, or *her* occurs, what is the form of the nominative; and occasionally using the pronouns in making short sentences, in order to fix a clear impression on their minds: such as, Where is my book? I saw it just now: the pen which I had in my hand: the book which he is reading; showing them in this last sentence you cannot understand what is meant by *he*, unless the noun to which it refers has been used before.

With respect to the verbs: they are constantly exercised in going through all the persons and tenses, past and present, on their slates: showing them they must use the present tense of the verb, or an auxiliary verb with the present participle if they speak of a thing while it is being done—the past form of the verb, or the auxiliary verb and past participle when the action is past; the teacher should write an example on the black board, such as

I work, We work,
Thou workest, Ye or you work,
He works, They work.

present participle working; *past*, wrought.

I write, etc.; Writing; Written:

particularly pointing out the auxiliary verbs when they occur with a past participle, and noting words where the past form of the verb and the past participle differ: as wrote, written; smote, smitten—calling upon the children to make short sentences to illustrate it. I wrote a letter—a letter was written; he broke a cup—a cup was broken.

This kind of teaching, young as many of them are, seems to exercise their minds, and gives them a great interest in what they are learning.

In the same way their attention must be called to all the other parts of speech as they occur.

It is very important that the teacher, in exercising them in these parts of grammar, at first should select words to which they can easily attach ideas; as *nouns*, for instance, the names of visible objects, such as ploughs, harrows, horses, cows, etc.;

then tea, coffee, sugar, wheat, oats, things connected with their daily occupations, the qualities of which being known to them they are more easily got into the way of knowing what an *adjective* is. Again, for *verbs*, select such words as express some action they are in the habit of doing—to walk, to ride, to plough, to harrow; then point out the difference to them, or ask them to explain the difference between *a* plough and *to* plough—*a* harrow and *to* harrow—*a* walk and *to* walk—*a* ride and *to* ride; and that the noun which is in the nominative case is the doer of the action, the verb expresses the doing it, and the noun in the objective case is the thing on which the verb acts.

It will be necessary to point out the inflection of nouns, although the nominative and objective cases are generally the same, in order to show them how this ought to be attended to in the personal pronouns, etc. For instance, suppose the teacher gives such a question as the following to write about: What is a spade made of, and what are its uses; he should take care to explain why he uses the pronoun *its*, and get them into the way of using the pronouns properly by making little sentences of their own to illustrate them—how verbs are made into nouns by adding *er*, as do, doer; walk, walker; talk, talker; plough, plougher, etc.—nouns into adjectives by adding *al*, as national, etc.

Compound words may be made very instructive and very amusing to them: bird-cage, pen-knife, etc.—the teacher to lead them to explain what a compound word is. If asked, they will answer perhaps "A word made of two words;" then show them that this is correct as far as it goes by mentioning several words made up of two, and ask what they would call a word made up of three words: they immediately see that the definition comes short of what was wanted; then show them that a "a word made up of two or more words" would include every case; this speaks to their understanding better than if a correct definition had been given at first.

Pen-knife—pen does not explain the material of which the knife is made, but the use to which it is applied.

Oak-table—*oak*, taken as an adjective, explaining of what the table is made: might say oaken table: writing-table; made up of a noun, *table*, and a participle explaining for what the table is used.

Tell them to bring, to-morrow morning, neatly written, six compound nouns, names of things about your houses. They will probably bring such as fire-side, bed-post, house-door, tea-pot, sugar-basin, milk-pail. In the morning the class to be arranged according to their merits, the teacher to interest them by showing how the meaning of the compound words is to be got at through the simple ones.

The importance of making the instruction turn a good deal upon their own occupations and domestic consumption, can scarcely be overrated; it leads to fireside conversation in an evening, between parents and children, of a most interesting kind; and by setting the children questions of this kind for an evening exercise, the whole family is set to work.

VELOCITY OF LIGHT—Olaf Roemer, an eminent Danish astronomer, while observing the eclipses of Jupiter's satellites, in 1676, found that light occupied about 16 minutes and 26 seconds in passing through the diameter of the earth's orbit, and assuming the distance of the earth from the sun to be nearly 95,000,000 miles he determined the velocity of light to be 192,500 miles in a second.

In 1723, Bradley, an English astronomer, discovered the aberration of light, and determined its velocity to be 191,515 miles per second.

In 1849, M. Fizeau invented an apparatus for measuring the velocity of light between terrestrial stations, and determined it to be 194,677 miles a second.

M. Foucault, with substantially the same apparatus, determined the velocity to be 185,177 miles per second.

Quite recently M. Fizeau has published the particulars of a long series of experiments made between stations about six miles apart, using the rays from a oxyhydrogen light; and he gives as the mean of 650 good observations, a velocity of 186,363 miles per second. The result obtained by Roemer is usually given in test books, and in fact is commonly quoted as the correct velocity of light. But the close agreement of the more recent researches of MM. Foucault and Fizeau, and the elegant methods used by these philosophers in their recent researches, render it nearly certain that the velocity of light in the air is between 185,177 and 185,363 miles per second.

DEPARTMENT OF PUBLIC INSTRUCTION.

IN the September number of the TEACHER we shall begin the publication of the *Manual*. We hope to have the School Law ready for distribution by the middle of July. The delay in publishing the Law is owing entirely to the delay in publishing the volume of Amendments to the Codes. We shall print enough copies to furnish each district clerk and each teacher with a copy—more we are not authorized to print. The copies will be distributed by the County Superintendents.

THE STATE BOARD OF EXAMINATION has been repeatedly asked to decide appeals from the markings of County Boards. The State Board has no power to hear such appeals: nor is the County Board obliged to submit the papers to the State Board. Should, however, out of courtesy, the papers be submitted and considered on appeal, and the decision be against the County Board, the latter has still the right, under the law, to adhere to its original decision, and to deny the candidate's claims to a certificate. Nothing is, therefore, gained by appealing to the State Board. For a Board who intentionally undermarks a candidate's papers in order to withhold a certificate from him, will stand upon the law and thwart any attempt at correction. And a Board who has marked the papers justly, will but be sustained by the State Board. In all the cases of appeal from the markings of County Boards heretofore decided by the State Board, it was uniformly found that the County Board had dealt more than justly with the candidate. The State Board has, therefore, decided to examine hereafter no papers except on applications for State certificates. Granted once the privilege of appealing from the markings of the County Board, the State Board would be overwhelmed with what the past has proved to be wholly unnecessary labor. The legitimate labor of examining the papers on applications for State certificates is already a heavy tax upon the State Board; and it would be an imposition to expect of the Board to re-examine the papers of the hundreds of applicants who quarterly appear before County Boards, and feel themselves aggrieved—not by their own ignorance and want of preparation—but by the just markings of the Boards.

THE FINDINGS of a County Board in examinations for county certificates are final. Hence it is not legal, after a County Board has once granted say a second grade county certificate, for the same or another Board to re-examine the papers at some subsequent meeting and to grant say a first grade certificate. For if this is within the province of a County Board, it is also within its province to declare that the candidate was entitled to no certificate at all, if it should be proved on a more rigid or literal examination than made by the former Board, that the candidate had been too much favored.

WE ARE led to make the above remarks by a question which has been submitted to us from San Luis Obispo county. At a meeting of the County Board a second grade certificate was, upon examination, granted to an applicant. Eighteen

months afterwards, the County Board, but now entirely changed in *personnel*, re-examines the papers of this applicant, and professes to find that his papers entitle him to a first grade certificate, which is accordingly issued. Of course this whole proceeding is illegal. Its absurdity needs no illustration.

WE DESIRE to draw the attention of County Boards to the fact that according to the strict letter of the law, a certificate can not be renewed after it has once expired. Holders of certificates should therefore be notified to present their certificates for renewal before said certificates have expired; and Boards should be careful to date the renewal of certificates from the very day that said certificates expire. The renewing of certificates which have expired may be contested and subject the Board to serious annoyances, if not penalties. The State Board has adopted the rule that applicants for the renewal of certificates must present their certificates before expiration. All seeming infringement of the law will thus be avoided.

WE THOUGHT we had been sufficiently explicit in stating in the May number of the TEACHER the conditions under which alone certificates can be granted by the different Boards of Examination. But either our statements were not clear and definite enough, or quite a number of even County Superintendents seem to labor under the impression that the provisions of the School Law can be changed according to the quality and quantity of the personal influence the applicant is able to bring to bear. We shall, therefore, once more state distinctly the conditions under which certificates can be granted by the different Boards. Certificates can be granted by the State Board only, 1st. Upon Normal School diplomas, from any *State* Normal School in the United States; 2d. Upon life diplomas granted by the State Board of Examination or Education in any of the United States; 3d. Upon examinations before County Boards, provided the applicant has attained the standard of proficiency prescribed by the State Board of Education, and provided, further, that the original examination papers be forwarded to the State Board within fifteen days after the close of the examination; 4th. Upon direct examination, should the Board decide to hold such. For reasons which have been explained several times, the State Board holds no direct examinations. Educational Diplomas can be issued to such persons only as present proof of five years' experience, and who have held a first grade State certificate at least a year.

County Boards can grant certificates only upon examinations held at the times specified by law, and in the studies prescribed by law, and upon the questions prepared by the State Board of Examination. Under no other conditions can the Board grant a certificate. The County Superintendent may issue a temporary certificate, valid until the next regular meeting of the County Board, to persons holding certificates of like grade granted in other counties.

City Boards must grant certificates under the same conditions as imposed upon County Boards; but may, in addition, grant, without examination, certificates of like grade to holders of certificates granted in other cities.

To issue certificates except as above specified, subjects the Board doing so, whether State, City, or County, to the penalties prescribed by law for misdemeanors.

ANOTHER QUESTION, though repeatedly decided through the TEACHER, is still constantly brought before us by County Superintendents, and others. It is this: may not a teacher holding no legal certificate, teach in a public school with the understanding that if at the next regular examination he obtain a certificate, he shall receive pay for the time taught while not a legal teacher? The law is as explicit on this point as on the granting of certificates. The law states that a warrant must be drawn in favor of a teacher only when said teacher is the holder of a proper certificate, in force for the full time for which the warrant is drawn. In addition, no teacher can take charge of a public school until he has filed his certificate with the County Superintendent. Of course an expired certificate, or a certificate not of full force for the school in which the teacher proposes to teach, is no certificate in the eyes of the law. Further, Section 1860 of the Political Code provides that no school district is entitled to receive any apportionment of State or County school moneys, unless the teachers employed in the schools of such district hold legal certificates of fitness for teaching, in full force and effect. We cannot see, therefore, how, under the law the question can come up whether a district has the authority to make, and the County Superintendent has the power to sanction, the engagement of any teacher, as sole teacher, or as principal, or as assistant, except said teacher is legally qualified.

OUR OPINION has been asked on the legality and interpretation of the following special law passed by the last Legislature:

An Act concerning the employment of teachers in the public schools in the Counties of Trinity and Shasta.

[Approved March 16, 1874.]

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. The Board of Examination of the public schools of either of the Counties of Trinity or Shasta are hereby authorized to employ any person to teach, in any of the school districts in said counties, not having the legal certificate, whenever a majority of the parents or guardians of children attending such school shall so petition.

SEC. 2. Such person, when employed, and the school under him or her, shall be entitled to all the rights and privileges of schools wherein the teachers hold first or second grade certificates.

SEC. 3. This Act shall take effect and be in force, in the counties named, immediately.

This Act very forcibly illustrates the average competency of the legislators who are emulous of legislating on school matters. For the whole Act is so meaningless, so illustrative of the ignorance of the plainest provisions of our school law, as on our statute books for over ten years, that, much to the delight of the people directly interested, the whole law becomes null and void from its very provisions. For first, our law never yet instituted and there are no existing *Boards of Examination of the public schools*, either for the counties of Trinity or Shasta, or for any other county of this State. Secondly, the employment of teachers rests exclusively in the hands of Boards of Trustees, and what teachers these Boards *must* employ, is specified in Section 1860, of the Political Code, quoted above. Third, what is meant by the provisions of Section 2 of this Act, we cannot imagine, as we do not know of any rights and privileges which schools taught by teachers holding first and second grade certificates enjoy over schools taught by teachers holding third grade certificates.

If we confine ourselves to the strict legal interpretation of the Act, and consider the phrase *Board of Examination of the public schools*, equivalent to *County*

Board of Examination, mentioned in Article XVI of Chapter iii, Title iii of Part iii, of the Political Code, the Act provides that the Shasta and Trinity County Boards of Examination, may, under certain circumstances, employ teachers for certain school districts. The Act was approved March 18, 1874. But by an Act approved March 28, 1874, the power of employing teachers is given exclusively to Boards of Trustees of school districts, and Boards of Education. So much of the special law under consideration, as conflicts with this power of Boards of Trustees, is therefore repealed and the Board of Examination of the public schools of either of the Counties of Trinity or Shasta—whatever Board that may mean—has no longer the power to employ teachers. The several Boards of Trustees of Shasta and Trinity Counties will therefore have to employ the teachers needed for their districts; and the employment of such teachers must be subject to the provisions of Section 1860 of the Political Code.

COUNTY SUPERINTENDENTS are once more reminded of the necessity of sending us promptly the Census Statistics required under Section 1551 of the Political Code. See remarks in the June number of the TEACHER, last paragraph on page 410.

THE COUNTY Superintendent's Annual Report, due at this office on or before August 10th, should be sent by express, or by mail, full letter postage prepaid. In transmitting the report, it should be rolled *lengthwise* on a wooden roller or other hard substance—in order to protect the report *in transitu*.

PARTICULAR ATTENTION is drawn to the necessity of sending a full and correct list of the District Clerks and their post office addresses. Frequent complaints are received from trustees about the non-receipt of the TEACHER, which is almost universally owing to the wrong name or wrong post office address of the clerk of the district given by the County Superintendent. Boards of Trustees should be requested, by means of postal cards, to inform the County Superintendent immediately after the first Saturday in July, of the name of the trustee who has been elected clerk for the ensuing year.

BY REQUEST, we wish to state that we do not hold that the provisions of Section 1870 of the Political Code prevent any school officer from recommending, on application, certain books on the library list as suitable books to be purchased for a district library. In fact, in very many cases, the teacher or the County Superintendent is the only person qualified to determine the books suitable for a library. The only interpretation which can be put upon Section 1870 is that when any books, apparatus, or furniture are bought for, or recommended to, a school, then the buyer or recommender, if a school officer, must not be an interested party, that is, a seller, or receive any recompense, or gift, or reward, either directly or indirectly, for selling or recommending said books, apparatus, or furniture. All books, apparatus and furniture *must* be selected and bought by the Board of Trustees, either in *propria persona*, or by the teacher, or County Superintendent, or other person acting for and at the request of the Board of Trustees. But in buying such books, apparatus, or furniture, the school officer must accept no commission, nor keep for his own use the discount from the regular retail prices, usually allowed by booksellers.

BY REFERENCE to the proceedings of the State Board of Education, it will be seen that publishers of text books are invited to lay before the Board, on or before January 5, 1875, proposals for supplying text books for use in the public schools of this State. Text books are prescribed by the State Board for the following studies: Reading, arithmetic and algebra, history, geography, grammar, physiology, natural history, drawing, penmanship, natural philosophy and music. The proposals, in order to receive any consideration, must be accompanied by sample copies of the books proposed to be supplied, and by a statement of the retail prices at which they will be sold for the full time for which they are adopted. "Introduction prices" for first introduction, can not be considered, as the law does not permit any increase over the first introduction price. All proposals must be addressed to the Superintendent of Public Instruction, as ex-officio Secretary of the Board. We give herewith the law which governs the Board in the adoption of books.

SECTION 1874 (Political Code). Any books once adopted as part of a uniform series of text-books must be continued in use for not less than four years; *provided*, that if at any time after their adoption, the retail price of such books is raised above the first introduction price, some other books shall be substituted for such books; *provided further*, that such substitution, or the adoption of new books in place of books which have been in use not less than four years must be in the following manner:

1. At least six months notice must be given of any proposed change of text-books.

2. Publishers of text-books must be invited to submit proposals for the supplying of the required text-books; said proposals must be accompanied by sample copies of the books proposed to be furnished, together with a statement of the retail price at which the books will be sold in this State for the full time for which the books are adopted.

3. If no proposals are received as required in the preceding subdivision, or if the books proposed to be furnished are inferior in contents or in binding, paper, typopraphy, or presswork, or are to be sold at a higher retail price than the books already in use, then the books already in use must be continued in use.

THE STATE BOARD OF EDUCATION

Met at the office of the Superintendent of Public Instruction, June 22d, at 3 P. M.

Present: Governor Booth, Superintendent Bolander, and Messrs. Kennedy, Kelly, Crawford, Lynch and McMeans.

Absent: Messrs. Denman and Allen.

The minutes of the meeting of Nov. 28, 1873, were read and approved.

On motion of Mr. Kennedy, the Superintendent of Public Instruction was authorized and directed to subscribe to the CALIFORNIA TEACHER for the number of copies required to supply the school officers and libraries named in Section 1729 of the Political Code.

The matter of text-books was brought up for consideration. After considerable discussion it was resolved that any action by this Board will be had in accordance with the provisions of Section 1874 of the Political Code, as amended by the last Legislature, and the following resolution, offered by Mr. Kennedy, was adopted:

Resolved by the State Board of Education, That publishers of text-books be invited to lay before the Board, on or before January 5, 1875, proposals for supplying text-books for use in the Public Schools of this State, said proposals to be

accompanied by sample copies of the books proposed to be furnished, together with a statement of the retail prices at which the books will be sold in this State for the full time for which they are adopted.

On recommendation of the State Board of Examination, life diplomas were granted to the following persons:

Watson, Miss Lizzie J., Alameda county.
Phelps, Mrs. M. W., Alameda county.
Craven, Andrew F., Alameda county.
Dodge, W. C., Alameda county.
Yates, W. A., Alameda county.
Blake, Chas. M., Napa county.
Bennett, Miss Mary H., Sacramento county.
Crawford, Mrs. J. F., Sacramento county.
Stowell, Fannie A., San Francisco.
Deetkin, Mrs. Lizzie G., San Francisco.
Castelhun, Miss Maria A., San Francisco.
Humphreys, Miss L. A., San Francisco.
Humphreys, Miss M. A., San Francisco.
Brown, Miss S. L., San Francisco.
Itsell, A. J., San Francisco.
O'Dwyer, Jas., San Francisco.
Smith, Miss Jennie, San Francisco.
Rattan, Volney, Santa Cruz county.
Gabriel, Mrs. C. E., Solano county.

Mistakes having been made in the filling out of the life diplomas granted by the Board November 28, 1873, duplicates were ordered issued to Miss Ora E. Miller and C. W. Otis.

It appearing that at some previous meetings of the Board life diplomas had been granted to Mrs. Emily Foster and Thomas Nicholson, and that their names are not recorded in the proceedings of the Board, it was ordered that the names of Mrs. Foster and Mr. Nicholson be now recorded as holders of life diplomas.

On motion of Mr. Lynch, it was resolved that 60 per cent. be fixed as the minimum to be attained by applicants for third-grade county certificates.

On motion of Mr. Lynch, it was resolved that all resolutions and acts of this Board now in force and affecting schools, County Superintendents and County Boards of Examination, be published in the appendix to the school law.

On motion of Mr. Kennedy, the rule heretofore prescribed by this Board requiring applicants for teachers' certificates to be at least 18 years of age, was rescinded.

At 5:15 P. M. the Board adjourned, to meet at the call of the Secretary.

HENRY N. BOLANDER,
Secretary.

EDITORIAL DEPARTMENT.

The illustrated article on Botany appearing in this number of the TEACHER, is the first of a series of illustrated articles on Natural History which we propose to publish for the use of teachers. The illustrations are expressly engraved for the TEACHER. They involve a considerable outlay on the part of the publisher, which will be cheerfully incurred, as it is the intention of the publisher and editors to make the journal more than ever a *Manual*—a book giving minute in-

structions for the several branches to be taught in our public schools. Our present educational literature represents too much what must be called the *dilettanteism* of education, which, while lavish in dilating upon the theories, principles and general ends of education, is on the other hand, very chary of distinctly indicating how much may reasonably be required of teachers. In other words, the manner of teaching receives almost exclusive attention, while the matter to be taught is left to the selection of publishers and book makers. One such article on Arithmetic as published in the TEACHER for January, 1873, is to the real teacher of more value than all the Primary Arithmetics ever published. The articles on Local Geography running through several numbers of the tenth volume of this journal, if properly used, will teach more of Geography in three years, than is now taught in eight years. Similar articles prepared for the other studies will assist the teacher to outline a rational programme, to properly prepare himself for his work, to emancipate himself and pupils from the thraldom of text-books, and to teach, instead of simply hearing recitations. The teacher should "teach his pupils and work with them." Text-books should be banished from the school room, except as books of reference. In Germany a text-book, in the American acceptation, is totally unknown.

WE QUOTE the following article from the *Illinois School Master* for June, in order to show the question which soon will claim the first rank among educational problems. We shall revert to this subject at some future occasion.

"The last Report of Hon. Henry N. Bolander, State Superintendent of Public Instruction in California, is before us. A large part of this report is taken up by an able discussion of three most important questions, viz: Compulsory Education, Increased Support for the Public Schools, and a more careful Preparation of Teachers. The second of these questions is specially adapted to California, but his discussion of the other two possesses nearly as much interest for people outside of the State, as for those to whom it is specially addressed. In discussing the first point, he shows that only about one-half of the children of the State attend school regularly; and that during the last eight years, the non-attendance has been reduced only 3.88 per cent. This shows that something ought to be done; whether a law *compelling* attendance is the proper remedy is the point on which all are not agreed.

"On the third topic, Mr. Bolander says: 'It must be confessed, that strictures and criticism upon our public schools have become of late so wide-spread and earnest that the efficiency of our whole system has been seriously questioned, not only by its enemies, but by its most steadfast friends. It is, therefore, incumbent upon all true friends of popular education, calmly to search for the evils which exist, to bring them to the light, and to apply the remedies.'

"These remarks certainly need not be confined to California. And the author's reason for this state of things, that is the lack of well-prepared, earnest teachers—is the reason for the existence of a similar state of things elsewhere. The evil is a serious one, from Maine to California; and, if our schools are ever overthrown, this will be the reason for their overthrow; and it will be a result not wholly without cause. Teachers, *teachers*, TEACHERS are, we may almost say, the sole want of our schools. We are not fully prepared to approve the writer's conclusion, that none but Normal graduates should be permitted by law to teach in the schools. But, we are prepared to say that, when the community will allow none but *competent* teachers in the schools, and will pay wages sufficient to secure competent teachers, wherever they may have been educated, then, and not till then, will the crying evils of our schools be in good measure removed.

"The report gives in full, *verbatim et literatim*, the examination papers of six candidates who were examined by the County Boards, granted first-class certificates, and their papers sent to the State Board for their approval, and the grant-

ing of State certificates thereon. These six were 'selected indiscriminately from about forty, no two from the same county.' Certainly, these papers show a lamentable want of qualification; but we apprehend that they can be fully matched without going a thousand miles.

"You are 'pulling on the right string,' Brother Bolander; may others help you; and may agitation on this point continue, until none but competent teachers can obtain a license in any State, and school officers will not employ any others. Then, we have no fears for the safety of our public schools."

THE FOLLOWING quotation from the *Connecticut School Journal* for April, shows the estimation in which the school work of California is held:

"We are indebted to the courtesy of the Hon. Henry N. Bolander, State Superintendent, for the Fifth Biennial Report of the Department of Public Instruction. It is a volume of 360 pages, closely filled with valuable statistics. able discussions, and important suggestions relative to the educational work of the Golden State. It is a monument of ability, earnestness and laboriousness. Compulsory education is ably discussed and advocated, Secretary Northrop being largely quoted in support of the argument. 'The Relation between Crime and Education,' 'Relation between Education and Pauperism,' 'Support of Common Schools,' 'The Need of Trained Teachers,' are among the subjects discussed. An interesting part of the work consists of the whole body of questions used during the past year, in the examination of applicants for State Teachers' Certificates, together with the answers to the same, given by five successful candidates. Another feature of interest to educators outside of California, as well as within it, is the course of study for all grades of schools, as revised by the Board of Education during the last year. We rise from the perusal of this report impressed with the conviction that California is rapidly moving toward the front in educational matters."

EDUCATIONAL ITEMS.

PROF. ALPHEUS CROSBY died at Salem, Mass., in the latter part of April. This item from the newspapers will carry deep sorrow to all who were so fortunate as to know Prof. Crosby—for no one who knew him can fail to remember his profound learning, his friendly, hearty ways, his quiet, modest manner, and his great services to the cause of education. He was for many years Professor at Dartmouth College, where he prepared the series of Greek text-books so well known in our schools and colleges. In 1857 he succeeded Dr. Richard Edwards, who had founded the School, as Principal of the State Normal School, at Salem, Mass. This post he filled with great acceptance for several years.

INDIANA.—The Supreme Court of Indiana has just sustained the decision of Judge Perkins, of the Marion County Superior Court, respecting the rights of colored pupils in schools. In Warren township, Marion county, some colored children applied for admission to the school for white children, there being no school for colored children in the township. The teacher refused to receive them; and in his refusal was sustained by the director and trustee. The case in Court followed, which was decided in favor of the claimants, by the Judge of Marion county, himself a life-long Democrat; and, as his decision has now been confirmed by the highest judicial authority of the State, the question may be considered settled in Indiana, for the present.

THE SUPREME COURTS of Ohio and New York have both decided that the organization of separate schools for colored youth is not a violation of the Fourteenth Amendment, provided that the schools for colored youth afford them educational advantages equal to those provided for white youth. These several decisions are unquestionably the true exposition of the Fourteenth Amendment, in its relation to public schools. It guarantees to white and colored youth equal public school advantages, but it does not require that they shall be taught in the same rooms. If it forbids separate schools for colored youth, it may also forbid separate schools for boys and girls. The Constitution guarantees that the privileges and immunities of citizens shall be equal; hence every colored child can demand admission to the public school, if equal advantages are not provided in a separate school. If the people of any State or community are not willing to admit white and colored youth to the same public school, they must sustain two equal schools for them.

Out of ninety-seven candidates for West Point Cadetship, thirty-two failed to pass examination, for deficiencies in writing, spelling, or arithmetic. All the colored candidates failed.

WE LEARN from the *Iowa School Journal* that the Supreme Court of Massachusetts decides that either a teacher or parent has the right to correct a child for misconduct on his way to or from school. The case was that of a parent vs. a teacher, for assault on a child, who punished a boy for throwing stones at a teamster while on his way home from school. The Court held that the teacher's authority is absolute at school, the parent's absolute at home, and between home and school the jurisdiction is concurrent; i. e., either may punish. The only care is, that both teacher and parent keep punishment within its humane and statutory limits of severity. We suspect that this statement makes the decision of the Court a little too broad, inasmuch as it has been generally held that the teacher's jurisdiction refers only to cases of misconduct that affect the reputation, discipline, or prosperity of the school.

ILLINOIS.—The General Assembly has passed a law to protect colored children in their rights to attend public schools. It makes the exclusion of a child from a public school, on account of color, an offense punishable by a fine of not less than five nor more than one hundred dollars. We believe that New York has a similar law. Another Act passed by the General Assembly of Illinois abolishes the provisional certificate, and requires every teacher to hold a regular certificate of either the first or second grade. The second grade certifies that the holder is qualified to teach the common English branches and the history of the United States. The first grade adds the elements of the natural sciences, physiology, and the laws of health. This is a recession from the position taken in the amended law, but we think it is an improvement. Advanced positions are, usually, most securely won by approaches.

THE OHIO Constitutional Convention has adopted an article permitting women to hold any school office except State Commissioner.

BILLS ARE pending in the Minnesota Legislature to abolish the normal schools

and the county superintendency, but the friends of education are hopeful of their defeat.

A NEW JERSEY teacher has taught a school of sixty-five pupils for two years, during which time not a single resident has visited her school. It is now proposed to dismiss her because she "wastes" three days in each month in reviews and examinations.

THE NEW YORK Legislature has passed a law for compulsory education, which will take effect January 1, 1875. The act contains 11 sections, the provisions of which are thus summarized by the *Tribune*.

Section 1 is as follows: All parents and those who have the care of children shall instruct them, or cause them to be instructed, in spelling, reading, writing, English grammar, geography and arithmetic. And every parent, guardian, or other person having control and charge of any child between the ages of eight and fourteen years shall cause such child to attend some public or private day school at least fourteen weeks in each year, eight weeks at least of which shall be consecutive, or to be instructed regularly at home at least fourteen weeks in each year in spelling, reading, writing, English grammar, geography and arithmetic; unless the physical or mental condition of the child is such as to render such attendance or instruction inexpedient or impracticable.

Section 2 provides that "no child under the age of fourteen shall be employed by any person to labor in any business whatever during the school hours of any school day of the school term of the public school in the school district or the city where such child is," unless the child shall have attended some public or private day school, or been regularly instructed at home in the branches provided in Section 1, at least fourteen weeks of the fifty-two weeks next preceding any and every year in which such child shall be employed; the child shall, at the time of such employment, deliver to the employer a written certificate, signed by a teacher or a school trustee of a district or of a school, certifying to such attendance or instruction. Any person employing a child contrary to these provisions shall, for each offense, pay a penalty of $50 to the treasurer or chief fiscal officer of the city or supervisor of the town in which such offense shall occur, the sum to be added to the public school money of the district in which the offense occurred.

Section 3 provides that the trustee or trustees of every school district, public or union school, in every town or city, shall, in September and February of each year, examine into the situation of the children employed in all manufacturing establishments in such school districts, and ascertain whether all the provisions of the act are duly observed, and report all violations to the treasurer or chief fiscal officer of said city, or the supervisor of said town.

Section 4 provides that whenever a child is temporarily discharged from employment in order to receive instruction or schooling, such child shall be sent to some public or private school, or regularly instructed at home, for the period for which the child has been discharged, to the extent of at least fourteen weeks in all in each year.

Section 5 authorizes and empowers the trustee or trustees of any school district or public school, or the president of any union school, or in case there is no such

school officer, then such officer as the Board of Education may designate, to see that Sections 1, 2, 3, 4 and 5 are enforced, and to report in writing all violations to the officers mentioned in the previous sections. On written notice, any person violating Sections 1, 3 and 4 shall pay a penalty for the first offense of $1, and for each succeeding offense, $5 for each week, not exceeding thirteen weeks in any one year.

Section 6 is as follows: In every case arising under this Act where the parent, guardian, or other person having the control of any child between the said ages of eight and fourteen years, is unable to provide such child for said fourteen weeks with the text-books required to be furnished to enable such child to attend school for said period, and shall so state in writing to the said trustee, the said trustee shall provide said text-books for said fourteen weeks, at the public school, for the use of such child, and the expense of the same shall be paid by the treasurer of said city or supervisor of said town, on the certificate of said trustee, specifying the items furnished for the use of such child.

Section 7 provides that when a child cannot be induced to attend school, such child shall be regarded as a habitual truant, and the person having charge of it shall be relieved of the penalties, after stating the circumstances in writing to the trustee, incurred under Sections 1, 4 and 5.

Section 8 empowers the Boards of Education and trustees to make all needful provisions, arrangements, rules and regulations concerning habitual truants, and children between eight and fourteen found wandering about the streets, having no lawful occupation, and growing up in ignorance, and provide suitable places for their discipline, instruction and confinement, when necessary, and may require the aid of the police and constables to enforce the said rules and regulations. These regulations, which may be amended and revised annually, in December, must be approved in writing by a Justice of the Supreme Court of the district, before going into effect as law.

Section 9 gives Justices of the Peace, Civil Justices and Police Justices jurisdiction of all actions brought under the Act or under the regulations authorized by Section 8. All actions are to be brought in the name of the treasurer or supervisor, under the direction of the trustee or trustees, or the officer designated by the Board of Education.

Section 10 provides that two weeks attendance at a half-time or evening school shall be counted as one week at a day school.

THE *Tribune* gives the following summary of educational affairs among the Cherokees, who now number about 60,000. Its Superintendent of Schools reports that about 2,300 children attend schools; that the schools are in session nine months annually, and that all the English branches are taught, including geometry, rhetoric, etc.; that there are 44 native teachers and 22 pale-faces; that they have one orphans' school, with 90 inmates; one female high school, presided over by a teacher from Mt. Holyoke, Mass., and one Moravian missionary school. These schools have been supported by the United States for 35 years past, or since their formation, and about $50,000 is now appropriated by Congress annually to sustain them. The Superintendent thinks that the Nation will in time support the schools, without aid from the Government.

THE STATE UNIVERSITY of Missouri, imitating Harvard, proposes to open its doors to teachers for a course of a few weeks instruction, especially in the natural sciences. It hoped to be ready for them by the 20th of April.

THE HON. W. G. RICH, Secretary of New Mexico, reports that the Territory has "made a commendable start in educational interests. So deep is the interest in some of the counties that the local school boards have made inquiries of the Territorial officers if there was not a law or some means by which the attendance of children could be enforced. One county reports that boys only are admitted to the schools. Four public schools are reported combined with parochial or mission schools. Taking the usual percentage of children relative to the aggregate population, there are 22,969 children in New Mexico of school age. Deduct the number reported attending both the public and private schools, and we shall find still in the Territory 15,974 children absentees, in most cases, doubtless, without the opportunity of attending school."

THE PUPILS of the Dover, N. H., high school are examined at regular intervals on topics which involve a careful reading of the daily and weekly newspapers.

THE NORMAL schools of the country supply only 4,000 trained teachers per annum, while the annual deficiency is estimated by the Bureau of Education at over 125,000.

IN SWEDEN, out of 358,000 children of school age, only 9,131, or three per cent., are uninstructed. Of the 7,000,000 voters in the United States, more than 1,000,000 cannot read the ballot they cast.

IN 1838, nurseries under the name of *Salles d'asile* were established in Paris, wherein mothers who were compelled to work away from home during the day could leave their children. After a time the plan was introduced of giving to the little ones taken in such instruction as would fit them for the elementary schools. Royal and imperial decrees fixed their organization, and there are now 104 of these infant schools in the city, and their inmates number 25,133.

PERSONS OF BOTH SEXES are thoroughly fitted for business pursuits, or for telegraphic operators, at this institution. The scholarships of this school are good for tuition in the thirty-six Bryant & Stratton Colleges. Young men are practically educated for Bankers, Merchants, Clerks and Bookkeepers by the most thorough course of actual business training ever introduced into any school on the Pacific Coast. Sessions continue day and evening throughout the entire year. Students can enter at any time. Just the course of study for young men in all walks of life, who wish to succeed. For full information regarding the school, call at the College office, 24 Post street, or send for HEALD'S COLLEGE JOURNAL, published monthly, and sent free to all by addressing,

E. P. HEALD, *Pres't Business College, San Francisco.*

CALIFORNIA
STATE NORMAL SCHOOL.

LOCATED AT SAN JOSE.

Calendar—1874-5.

FIRST TERM.

Opens Wednesday, June 10th, and closes October 23d, 1874.
Fall vacation, from October 24th to November 2d, inclusive.

SECOND TERM.

Opens Wednesday, November 4th, 1874, and closes March 25th, 1875.
Christmas vacation, from December 23d to January 4th, inclusive.

PROGRAMME FOR CLOSING WEEK.

Final examinations, Monday, Tuesday, and Wednesday.
Lecture before literary societies, Wednesday evening.
Graduating exercises, Thursday, 2 o'clock, P. M.
Alumni Association, literary exercises, Thursday evening.

CONDITIONS OF ADMISSION.

For admission to the Junior Class, the following qualifications are requisite:

1. *Age.*—If ladies, sixteen; if gentlemen, seventeen years.

2. *Certificates.*—A valid Certificate, State or County, of any grade.

3. *Examinations.*—A limited number, for the present, may be admitted on examination. They must present certificates of good moral character, and pass an examination such as would be required to obtain a Third Grade Certificate.

For admission to the Senior Class, pupils must present a valid Certificate, and pass an examination upon the studies in the Junior year.

None are admitted to the Senior Class under seventeen years of age.

Pupils may be admitted to the Junior Class at any time during the year, but all applicants for admission to the Senior Class should present themselves at the beginning of the year, as none are graduated who have not been one year in attendance in the school. This is necessary in order to receive the necessary instruction in Methods of Teaching.

Those who are unable to pass the preliminary examination for admission to the Normal School, can enter the Preparatory Class, until qualified.

For further particulars, apply for Catalogues or information, to

CHAS. H. ALLEN, Principal.

THE

CALIFORNIA TEACHER.

AUGUST, 1874.

VOL. XII. SACRAMENTO. No. 2

DEPARTMENT OF PUBLIC INSTRUCTION.

ACCORDING to promise, we devote this number of the TEACHER to the illustrating of the new method of apportioning school moneys enacted by the last Legislature. As we expected, so many County Superintendents have asked for instructions that, with the clerical force at our command, we could not have satisfactorily answered all the questions submitted to us in any other way. We give, therefore, a table for each and every county, and such other instructions as we deem necessary to a full understanding of the provisions of the law. This would have been of more value, in some instances, if the TEACHER had been published at an earlier date. But this was out of the question. The late appearance of the TEACHER is owing entirely to the tardiness with which some County Superintendents have responded to our request to send us the Census Statistics of their respective counties at the earliest practical date. Ventura reported on the fifth of July; Trinity did not report till the first of August. All reports had to be in our hands before we could begin our work; and to have the TEACHER come to hand before the first of September, we have to crowd into a few days what ought to be the work of as many weeks.

A few County Superintendents do not seem to know the difference between the reports required to be made under the provisions of section 1551 and section 1543, subdivision 14. respectively; at least the Annual Report was sent by them, instead of the Report of Census Statistics. These County Superintendents certainly have either not read or not understood our remarks made in the May number of the TEACHER, page 379, and in the June number, page 410, in which we even gave the form of the blanks which would be furnished by this department. In the July number attention was again drawn to the matter. Surely those who run might have read and learned *which* report we desired to have as soon as possible. *En passant*, a county which should have failed to report its census statistics to us on or before the first of August, would have lost its August apportion-

ment of State school money. Hence our notice to several County Superintendents, sent July 21st.

As a preliminary we must settle the status of joint districts, and new districts formed by the subdivision of old districts. It is an open question whether joint districts, that is districts lying partly in two counties, and drawing school moneys from both, have any legal standing, except they are formed under a Legislative Act. There are only one or two joint districts which were formed by Legislative authority; most joint districts have arisen from the subdivision of counties, or the changing of the boundaries of counties. Thus by the subdivision of Monterey County into Monterey and San Benito Counties, several districts which on their formation were entirely within Monterey County, now lie partly in Monterey and partly in San Benito County. So with most of the joint districts throughout the State. Heretofore, no difficulties have arisen, as far as we know, about the apportioning of school moneys to these districts; each county would give to the children of the district residing in the county, the same pro rata apportionments as the children of the non-joint districts received. But now, when every district is entitled to at least five hundred dollars, some of these joint districts claim five hundred dollars from each county. We submit the following, and to illustrate our remarks we shall take as an example Fair View District, which lies partly in Placer, and partly in Sutter County. To avoid misapprehension we state that, as far as we know, this district has not claimed five hundred dollars from each county. But assuming that the district did make this claim, then to allow the claim, that portion of Fair View District lying in Placer County would have to be considered as an entire district, as far as Placer County is concerned; and that other portion of the district lying in Sutter County would have to be considered as another entire district as far as Sutter County is concerned. But a school is kept—that is a school house is situated and a teacher is teaching—in only one portion of the district, either in that portion lying in Placer County, or in that lying in Sutter County. If in Placer County, then that portion of the district lying in Sutter County has kept no public school at all, and is not entitled to any school money whatever; and *vice versa*. Hence the children residing in Sutter County might be and most likely would be, excluded from the school kept in Placer county, and *vice versa*. Furthermore, in some cases, a joint district has more than ten children only in one county, and less than that number in the other. This latter portion of the district will therefore be entitled to no school money, even if a school had been kept in each portion of the district. And if, furthermore, we bear in mind that these joint districts are frequently so situated that their several portions can not be united to districts in the respective counties; and remembering the more or less direct recognition of joint districts by the different school laws enacted in this State, equity demands that while joint districts will not be entitled to five hundred dollars from each county, they are yet entitled to such proportion of school money from each county as will give them five hundred dollars in all. This has been our mode of apportioning school moneys to joint districts named in the following tables. Fair View District having 25 census children in Sutter County, and 12 in Placer County, will be entitled to $162 17 from Placer County, and $337 83 from Sutter County.

In regard to new districts formed by the subdivision of old districts, our decision is as follows: Subdivision first of section 1858 provides that County Superin-

tendents must ascertain the number of teachers each district is entitled to, by calculating one teacher for every one hundred census children, or fraction thereof of not less than fifteen census children, as *shown by the next preceding school census*. As the school census of any year *must* be in the hands of the County Superintendent on or before the first of July, that is one day after the close of that school year, only those districts which existed before the first of July can be considered by the County Superintendent. And to these districts only must five hundred dollars be apportioned, according to subdivision third of section 1858. If a district is subdivided, the money apportioned to the district during the year, must be apportioned pro rata between it and its subdivisions. In other words, a new district can not obtain the five hundred dollars provided for in section 1858, for the year in which it was formed; it will receive only a pro rata share of the money apportioned to the old district.

In the following tables, column 1 gives the names of the districts; column 2, the number of census children in the respective districts; column 3, the number of teachers assigned to each district in accordance with the provisions of subdivision 1 of section 1858; column 4 gives the total amount which must be apportioned to each district; column 5 gives the amount each district will receive from the apportionment of State school money made August 1, 1874. In column 3, one teacher is allowed to every district having 15 and less than 115 census children; two teachers to every district having 115 and less than 215 census children, etc. As districts having 10 and less than 15 census children, must receive $300, and as this is 3-5ths of $500, we have allowed 3-5ths of a teacher to such districts, in order that the total number of teachers for the county may be ascertained, as required by subdivision 2 of section 1858. In cases of joint districts we have determined the exact amount (column 4) to be apportioned by each of the counties in which the districts lie; but in column 3 we have given such an approximate fraction as is most easy of handling. Thus, in the case of Fair View District, a joint district between Placer and Sutter Counties, the district will receive $162 17, or 12-37ths of $500, from Placer, and $337 83, or 25-37ths, from Sutter County. But instead of entering 12-37ths and 25-37ths, respectively, in column 3, we have taken the approximate fractions 2-5ths for Placer, as fifths already occur in column 3, and 3-5ths for Sutter county. The total of column 3 multiplied by 500 will give the minimum amount of school money needed for the county. Deducting from this the State apportionments of the previous year, less ten per cent., the remainder will be the minimum amount which must be raised by county taxes, except this amount should be less than sufficient to raise a sum equal to three dollars for each census child in the county, in which case the minimum amount will be such a sum as will be equal to three dollars for each census child (see section 1817). Thus in the case of Alameda County, 98⅛ is the total number of teachers assigned to the county; the ⅛ represents $160 for the joint district Midway; so multiplying 98 by 500, and adding 160 for the ⅛, we have $49,160 as the minimum amount of school money needed for Alameda County in order to give each district $500 for every teacher assigned it. Deduct from this $18,343 (the amount of the State apportionments of the preceding school year, less 10 per cent.), we have $30,817, which is the minimum to be raised from county taxes, as it is not less than a sum sufficient to raise a sum equal to three dollars for each census child in the county. 98⅛, the total of column 3,

will also be the divisor by which so many apportionments, whether of State or county school moneys, made between July 1st, 1874, and June 30, 1875, will have to be divided, until the sum of the different quotients thus obtained, will give each district $500 for every teacher assigned it. In the case of Alameda County, the apportionment of State school money for August 1st, 1874, amounts to $5,343. Dividing this by 98⅓, we have $54 33, which must be apportioned to each district for every teacher assigned it. Five teachers being assigned to Alameda District, said district will receive 5×54 33. or $271 65, as its share of the State apportionment made August 1, 1874. $49,160 of State or county school moneys, or of both, will have to be apportioned before the sum of the quotients will be sufficient to give each district $500 for every teacher assigned. All school moneys in excess of $49,160 will have to be apportioned pro rata, that is in proportion to the number of census children, to the districts having not less than fifty census children. In column 4 we have designated these districts by putting *p. r.* after the amounts which must be apportioned to each district. That is to say, after $2,500 have been apportioned to Alameda District, $1,000 to Alvarado District, etc., or $49,160 for the whole county, any remainder must be apportioned to the districts marked *p. r.* in column 4.

At the head of each table we have placed: First, the number of census children as reported by the County Superintendent, on or before August 1st, 1874. Second, the county's amount of the State apportionment made August 1st, 1874. Third, the minimum amount of school fund needed for 1874–5 (the sum of column 4. See section 1817). This amount must be reported to the Board of Supervisors, and the Auditor, respectively. It also shows the amount of State and county school moneys to be apportioned in order to give $500 to each district for every teacher assigned it (section 1858, subdivisions 1 to 3, inclusive). Any amount in excess of this must be apportioned to the districts marked *p. r.* in column 4 (section 1858, subdivision 4). Fourth, the amount of State school fund apportioned to the county for 1873–4. Deducting from this ten per cent., and deducting the remainder from the amount given in 3, we have: Fifth, the amount to be raised from county school tax, except this amount should be less than sufficient to give a sum equal to three dollars for each census child in the county, in which case such an amount as will do this must be substituted. Sixth, the probable amount of State school fund to be apportioned to each county for 1874–5. We have calculated $7 50 for each census child—a safe calculation as far as we can judge. As this amount is far in excess of the amount given under 4, we have, seventh, given the minimum amount (section 1817) of county school fund needed, if the amount given under 7 is substituted for the amount given under 4.

For Modoc, Siskiyou and Sonoma Counties the manner of apportioning school funds will be as follows: If districts having 100 or more census children, receive $1 per census child, districts having 90 and less than 100 census children, will receive $1 10 per census child; districts having 80 and less than 90, will receive $1 20 per census child, etc. Now in the case of Modoc County, it will take $1,440 40 to apportion $1 per census child to districts having 100 or more census children; $1 20 per census child to districts having 80 and less than 90 children, etc. (see columns 4 and 5 of table). Therefore, as many times as we have $1,440 40, so many times $1 per census child must we apportion to districts with 100 or more census children; so many times 1.5 per census child to districts having 50 and less than 60 census children, etc. $1,440 40 is contained 0.43 times in $629 20, the amount of State apportionment for August 1, 1874; so that Centreville will receive 0.43×1×107=$46 01; Eagleville, 0.43×1.5×50=$32 25. In short, divide the money to be apportioned by the total of column 5 of the table; multiply the quotient by the pro rata given in column 4; this product multiply in the number of census children in the district (column 2), and the resulting product will be the amount to be apportioned to the district.

Small balances will sometimes remain unapportioned. These must be carried forward. In conclusion, we draw attention to the fact that districts must maintain this year, from July 1, 1874, to June 30, 1875, at least a six months' school, in order to be entitled to any school fund next year.

ALAMEDA.

Number of census children, 8,220. State apportionment, August 1, 1874, $5,343. Minimum amount of school fund needed for 1874-5, $49,160. Amount of State school fund for 1873-4, $20,381 45. Amount to be raised from county school tax, $30,817. Probable amount of State school fund for 1874-5, $61650. Amount to be raised from county school tax, $24,660.

DISTRICTS.	Number of Census Children.	Number of Teachers assigned.	Amount to be Apportioned to District.	State Apportionment, August 1, 1874.
Alameda	498	5	$2500 p. r.	$271 65
Alvarado	132	2	1000 p. r.	108 66
Alviso	97	1	500 p. r.	54 33
Bay	60	1	500 p. r.	54 33
Castro Valley	61	1	500 p. r.	54 33
Centreville	120	2	1000 p. r.	108 66
Cosmopolitan	85	1	500 p. r.	54 33
Eden Vale	61	1	500 p. r.	54 33
Eureka	141	2	1000 p. r.	108 66
Fruit Vale	103	1	500 p. r.	54 33
Inman	63	1	500 p. r.	54 33
Laurel	328	4	2000 p. r.	217 32
Lincoln	34	1	500	54 33
Livermore	220	3	1500 p. r.	162 99
Lockwood	92	1	500 p. r.	54 33
May	93	1	500 p. r.	54 33
Mission San José	123	2	1000 p. r.	108 66
Mountain House	37	1	500	54 33
Moury's Landing	36	1	500 p. r.	54 33
Murray	60	1	500 p. r.	54 33
Oakland	3952	40	20000 p. r.	2173 20
Ocean View	116	2	1000 p. r.	108 66
Palomares	59	1	500 p. r.	54 33
Peralta	168	2	1000 p. r.	108 66
Pleasanton	150	2	1000 p. r.	108 66
Redwood	44	1	500	54 33
San Lorenzo	191	2	1000 p. r.	108 66
Stony Brook	20	1	500	54 33
Suñol	63	1	500 p. r.	54 33
Summit	44	1	500	54 33
Temescal	157	2	1000 p. r.	108 66
Townsend	84	1	500 p. r.	54 33
Union	423	5	2500 p. r.	271 65
Vallecito	57	1	500 p. r.	54 33
Washington	132	2	1000 p. r.	108 66
Warm Springs	87	1	500 p. r.	54 33
[Joint Dist. with Midway, San Joaquin.]				
Midway	9	⅓	160	18 11
	8,220	98⅓	49,160	5,342 45

ALPINE.

Number of census children, 97. State apportionment, August 1, 1874, $63 05. Minimum amount of school fund needed for 1874-5, $2,500. Amount of State school fund for 1873-4. $336 45. Amount to be raised from county school tax, $2,197. Probable amount of State school fund for 1874-5, $727 50. Amount to be raised from county school tax, $1,845.

Clay	15	1	$500	12 61
Everett	21	1	500	12 61
Franklin	17	1	500	12 61
Lincoln	23	1	500	12 61
Webster	21	1	500	12 61
	97	5	2,500	63 05

AMADOR.

Number of census children, 2,297. State apportionment, August 1, 1874, $1,493 05. Minimum amount of school fund needed for 1874-5, $18,500. Amount of State school fund for 1873-4, $6,478 36. Amount to be raised from county school tax, $12,669. Probable amount of State school fund for 1874-5, $17,227 50. Amount to be raised from county school tax, $6,891.

Amador City	159	2	$1000	p. r.	80 70
Aqueduct City	31	1	500		40 35
Buena Vista	47	1	500		40 35
Clinton	39	1	500		40 35
Drytown	75	1	500	p. r.	40 35
Fiddletown	116	2	1000	p. r.	80 70
Franklin	31	1	500		40 35
Forest Home	66	1	500	p. r.	40 35
Ione Valley	49	1	500		40 35
Julian	112	1	500	p. r.	40 35
Jackson	206	2	1000	p. r.	80 70
Jackson Valley	34	1	500		40 35
Lancha Plana	53	1	500	p. r.	40 35
Mountain Echo	26	1	500		40 35
Mountain Springs	21	1	500		40 35
Milligans	43	1	500		40 35
New York Ranch	29	1	500		40 35
Oneida	96	1	500	p. r.	40 35
Plymouth	154	2	1000	p. r.	80 70
Pine Grove	49	1	500		40 35
Sutter Creek	360	4	2000	p. r.	161 40
Stony Creek	21	1	500		40 35
Union	57	1	500	p. r.	40 35
Upper Rancharia	41	1	500		40 35
Volcano	188	2	1000	p. r.	80 70
Williams	46	1	500		40 35
Willow Springs	53	1	500	p. r.	40 35
Washington	75	1	500	p. r.	40 35
Buckeye Valley	20	1	500		40 35
	2,297	37	18,500		1,492 95

BUTTE.

Number of census children, 3,126. State apportionment, August 1, 1874, $2,031 90. Minimum amount of school fund needed for 1874-5, $29.987. Amount of State school fund for 1873-4, $8,187 47. Amount to be raised from county school tax, $22,618. Probable amount of State school fund for 1874-5, $23,445. Amount to be raised from county school tax, $9.378.

Antelope	32	1	$500		33 86
Bangor	53	1	500	p. r.	33 86
Bidwell	28	1	500		33 86
Butte Valley	54	1	500	p. r.	33 86
Butte	46	1	500		33 86
Cañon Creek	37	1	500		33 86
Centerville	29	1	500		33 86
Central House	33	1	500		33 86
Chico	620	7	3500	p. r.	237 02
Cherokee	179	2	1000	p. r.	67 72
Cottonwood	42	1	500		33 86
Dayton	85	1	500	p. r.	33 86
Delaplain	60	1	500	p. r.	33 86
Eureka	30	1	500		33 86
Evansville	24	1	500		33 86
Fairview	19	1	500		33 86
Franklin	12	3-5ths	300		20 31
Forbestown	67	1	500	p. r.	33 86
Gridley	52	1	500	p. r.	33 86
Hamilton	146	2	1000	p. r.	67 72
Inskip	13	3-5ths	300		20 31
Kimshew	45	1	500		33 86
Live Oak	23	1	500		33 86
Lone Tree	56	1	500	p. r.	33 86
Lovelock	32	1	500		33 86
Little Chico	62	1	500	p. r.	33 86
Manzanita	30	1	500		33 86
Meridian	82	1	500	p. r.	33 86
Mesilla Valley	43	1	500		33 86
Morris' Ravine	26	1	500		33 86
Mountain Spring	35	1	500		33 86
Mud Creek	35	1	500		33 86
Mooretown	33	1	500		33 86
Meadow	30	1	500		33 86
Nimshew	18	1	500		33 86
Nelson	48	1	500		33 86
Oroville	290	3	1500	p. r.	101 58
Oregon City	54	1	500	p. r.	33 86
Pine Creek	56	1	500	p. r.	33 86
Rio Seco	46	1	500		33 86
Rock Creek	50	1	500	p. r.	33 86
Salem	29	1	500		33 86
Stoneman	37	1	500		33 86
Union	30	1	500		33 86
Upham	32	1	500		33 86
Webster	39	1	500		33 86
West Liberty	43	1	500		33 86
Wyandotte	84	1	500	p. r.	33 86
Wyman's Ravine	33	1	500		33 86
York	20	1	500		33 86
[Joint Dist. with Woodville, Yuba Co.]					
Clipper Mills	24	4-5ths	387		27 09
	3126	60	$29987		2,031 58

CALAVERAS.

Number of census children, 2,300. State apportionment, August 1, 1874, $1,495 00. Minimum amount of school fund needed for 1874-5, $19,723 40. Amount of State school fund for 1873-4, $6,786 09. Amount to be raised from county school tax, $13,616. Probable amount of State school fund for 1874-5, $17,250. Amount to be raised from county school tax, $6,900.

Angels	223	3	1500 p. r.	113 52
Altaville	120	2	1000 p. r.	75 68
Brushville	21	1	500	37 84
Camanche	115	2	1000 p. r.	75 68
Copperopolis	117	2	1000 p. r.	75 68
Chili Gulch	49	1	500	37 84
Cave City	51	1	500 p. r.	37 84
Calaveritas	59	1	500 p. r.	37 84
Campo Seco	66	1	500 p. r.	37 84
Douglass Flat	55	1	500 p. r.	37 84
Eureka	72	1	500 p. r.	37 84
Fourth Crossing	70	1	500 p. r.	37 84
Jenny Lind	76	1	500 p. r.	37 84
Mokelumne Hill	218	3	1500 p. r.	113 52
Murphys	133	2	1000 p. r.	75 68
Musquito Gulch	19	1	500	37 84
Milton	43	1	500	37 84
Negro Gulch	41	1	500	37 84
Pleasant Springs	16	1	500	37 84
Petersburgh	90	1	500 p. r.	37 84
Palomo	70	1	500 p. r.	37 84
Robinson's Ferry	21	1	500	37 84
San Andreas	175	2	1000 p. r.	75 68
Sheep Ranch	42	1	500	37 84
Spring Valley	37	1	500	37 84
Salt Spring Valley	38	1	500	37 84
Telegraph City	35	1	500	37 84
Vallecito	97	1	500 p. r.	37 84
Washington Ranch	31	1	500	37 84
West Point	79	1	500 p. r.	37 84
[Joint Dist with Black Hills, Stanislaus.]				
Black Hills	21	½	223 40	18 92
	2,300	39½	$19723 40	1,494 68

COLUSA.

Number of census children, 2,041. State Apportionment, August 1, 1874, $1,326 65. Minimnm amount of school fund needed for 1874-5, $22,616 28. Amount of State school fund for 1873-4, $5,098 84. Amount to be raised from county school tax, $18,027 33. Probable amount of State school fund for 1874-5, $15,308 50. Amount to be raised from county school tax, $8,839.

Antelope	34	1	500	29 31
Ashton	36	1	500	29 31
Butte Creek	18	1	500	29 31
Black Butte	43	1	500	29 31
Bridgeport	53	1	500 p. r.	29 31

Bear Valley	27	1	500		29 31
Cortina	33	1	500		29 31
Central	26	1	500		29 31
Colusa	327	4	2000	p. r.	117 24
Cherokee	40	1	500		29 31
Dry Slough	60	1	500	p. r.	29 31
Excelsior	20	1	500		29 31
Emigrant	50	1	500	p. r.	29 31
Franklin	72	1	500	p. r.	29 31
Freshwater	74	1	500	p. r.	29 31
Fairview	38	1	500		29 31
Grand Island	71	1	500	p. r.	29 31
Grindstone	31	1	500		29 31
Independent	35	1	500		29 31
Indian Valley	51	1	500	p. r.	29 31
Jacinto	70	1	500	p. r.	29 31
Jefferson	18	1	500		29 31
Johns	53	1	500	p. r.	29 31
Jackson	67	1	500	p. r.	29 31
Kanawha	24	1	500		29 31
Lake	32	1	500		29 31
Liberty	32	1	500		29 31
Marion	22	1	500		29 31
Mountain	26	1	500		29 31
Montgomery	34	1	500		29 31
Newville	58	1	500	p. r.	29 31
Newland	36	1	500		29 31
Plaza	56	1	500	p. r.	29 31
Princeton	69	1	500	p. r.	29 31
Pleasant View	21	1	500		29 31
Prairie	16	1	500		29 31
Quicksilver	23	1	500		29 31
Union	82	1	500	p. r.	29 31
Webster	25	1	500		29 31
Washington	52	1	500	p. r.	29 31
Willow	53	1	500	p. r.	29 31
White Bank	23	1	500		29 31
[Joint Dist. with Floyd Dist., Tehama.]					
Stony Creek	10	¼	116 28		7 32
	2,041	45¼	22,616 28		1,326 27

CONTRA COSTA.

Number of census children, 2,851. State apportionment, August 1, 1874, $1,853 15. Minimum amount of school fund needed for 1874–5, $22,300. Amount of State school fund for 1873–4, $7,844 85. Amount to be raised from county school tax, $15,240. Probable amount of State school fund for 1874–5, $21,382 50. Amount to be raised from county school tax, $8,553.

Alamo	61	1	500	p. r.	41 55
Amador	13	3-5ths	300		24 93
Antioch	178	2	1000	p. r.	83 10
Alhambra	45	1	500		41 55
Bay Point	65	1	500	p. r.	41 55
Brown's Valley	51	1	500	p. r.	41 55
Carbondale	224	3	1500	p. r.	124 65

Central	39	1	500		41 55
Concord	104	1	500	p. r.	41 55
Danville	47	1	500		41 55
Deer Valley	32	1	500		41 55
Excelsior	103	1	500	p. r.	41 55
Eden Plain	55	1	500	p. r.	41 55
Green Valley	52	1	500	p. r.	41 55
Iron House	53	1	500	p. r.	41 55
Lafayette	58	1	500	p. r.	41 55
Liberty	63	1	500	p. r.	41 55
Lime Quarry	60	1	500	p. r.	41 55
Lone Tree	46	1	500		41 55
Martinez	171	2	1000	p. r.	83 10
Moraga	52	1	500	p. r.	41 55
Morgan Territory	40	1	500		41 55
Mt. Diablo	120	2	1000	p. r.	83 10
Mt. Pleasant	74	1	500	p. r.	41 55
Oak Grove	45	1	500		41 55
Pinole	78	1	500	p. r.	41 55
Pleasant Hill	48	1	500		41 55
Pacheco	156	2	1000	p. r.	83 10
Rodeo Valley	32	1	500		41 55
San Ramon	69	1	500	p. r.	41 55
San Pablo	319	4	2000	p. r.	166 20
Somersville	131	2	1000	p. r.	83 10
Sycamore	48	1	500		41 55
Tassajara	64	1	500	p. r.	41 55
Willow Springs	55	1	500	p. r.	41 55
	2,851	443-5	22,300		1,853 13

DEL NORTE.

Number of census children, 419. State apportionment, August 1, 1874, $272 35. Minimum amount of school fund needed for 1874–5, $5,000. Amount of State school fund for 1873–4, $1,034 34. Amount to be raised from county school tax, $4,070. Probable amount of State school fund for 1874–5, $3,142 50. Amount to be raised from county school tax, $2,172.

Crescent	216	3	1500	p. r.	81 69
Bradford	60	1	500	p. r.	27 23
Happy Camp	37	1	500		27 23
Rowdy Creek	25	1	500		27 23
Redwood	16	1	500		27 23
Ocean	27	1	500		27 23
Fort Dick	20	1	500		27 23
Lincoln	18	1	500		27 23
	419	10	5,000		272 33

EL DORADO.

Number of census children, 2,448. State apportionment, August 1, 1874, $1,591 20. Minimum amount of State school fund needed for 1874–5, $21,448 88. Amount of State school fund for 1873–4, $7,101 82. Amount to be raised from

county school tax, $15,057. Probable amount of State School fund for 1874-5, $18,360. Amount to be raised from county school tax, $7,344.

Buckeye	62	1	500	p. r.	37 00
Blairs'	64	1	500	p. r.	37 00
Bear Creek	28	1	500		37 00
Carson Creek	17	1	500		37 00
Cold Spring	37	1	500		37 00
Coloma	151	2	1000	p. r.	74 00
Coon Hollow	86	1	500	p. r.	37 00
Diamond Spring	64	1	500	p. r.	37 00
El Dorado	106	1	500	p. r.	37 00
French Creek	44	1	500		37 00
Garden Valley	45	1	500		37 00
Greenwood	70	1	500	p. r.	37 00
Georgetown	164	2	1000	p. r.	74 00
Green Valley	38	1	500		37 00
Gold Hill	56	1	500	p. r.	37 00
Indian Diggings	30	1	500		37 00
Jayhawk	61	1	500	p. r.	37 00
Kelsey	79	1	500	p. r.	37 00
Lake Valley	31	1	500		37 00
Latrobe	79	1	500	p. r.	37 00
Missouri Flat	22	1	500		37 00
Mountain	46	1	500		37 00
Mount Ankum	68	1	500	p. r.	37 00
Musquito	18	1	500		37 00
Nashville	18	1	500		37 00
Newtown	16	1	500		37 00
Oak Hill	53	1	500	p. r.	37 00
Pilot Hill	30	1	500		37 00
Placerville	376	4	2000	p. r.	148 00
Pleasant Valley	89	1	500	p. r.	37 00
Salmon Falls	43	1	500		37 00
Spanish Dry Diggings	25	1	500		37 00
Tennessee	48	1	500		37 00
Union	102	1	500	p. r.	37 00
Uniontown	55	1	500	p. r.	37 00
United	63	1	500	p. r.	37 00
Cave Valley	16	1	500		37 00
[Joint Dist. with Natoma, Sacramento.]					
Natoma	33	¾	317 30		27 75
[Joint District with Rattlesnake, Placer.]					
Wild Goose	15	¼	131 58		9 25
	2,448	43	21,448 88		1,591 00

FRESNO.

Number of census children, 1,146. State apportionment, August 1, 1874, $744 90. Minimum amount of school fund needed for 1874-5, $1,200. Amount of State school fund for 1873-4, $3,111 15. Amount to be raised from

county school tax, $9,200. Probable amount of State school fund for 1874-5, $8,595. Amount to be raised from county school tax, $4,265.

Arcola	44	1	500		31 03
Centerville	28	1	500		31 03
Chowchilla	39	1	500		31 03
Clark's Valley	30	1	500		31 03
Dalton	34	1	500		31 03
Dry Creek	56	1	500	p. r.	31 03
Fair View	34	1	500		31 03
Fancher	33	1	500		31 03
Fresno	64	1	500	p. r.	31 03
Fresno City	55	1	500	p. r.	31 03
Fort Washington	24	1	500		31 03
Hazelton	21	1	500		31 03
Kingston	82	1	500	p. r.	31 03
Lake	39	1	500		31 03
Millerton	80	1	500	p. r.	31 03
New Idria	106	1	500	p. r.	31 03
Panoche	108	1	500	p. r.	31 03
Pleasant Vale	56	1	500	p. r.	31 03
Pleasant Valley	51	1	500	p. r.	31 03
Round Mountain	21	1	500		31 03
San Joaquin	38	1	500		31 03
Scottsburg	40	1	500		31 03
Squaw Valley	40	1	500		31 03
Washington	23	1	500		31 03
	1,146	24	12,000		744 72

INYO.

Number of census children, 319. State apportionment, August 1. 1874, $207 35. Minimum amount of school fund needed for 1874-5, $4,000. Amount of State school fund for 1873-4, $868. Amount to be raised from county school tax, $2,219. Probable amount of State school fund for 1874-5, $2,329 50. Amount to be raised from county school tax, $1,847.

Bishop Creek	53	1	500	p. r.	25 91
Big Pine	30	1	500		25 91
Independence	39	1	500		25 91
Irving	17	1	500		25 91
Lone Pine	83	1	500	p. r.	25 91
Milton	31	1	500		25 91
Round Valley	28	1	500		25 91
Union	38	1	500		25 91
	319	8	4,000		207 28

KERN.

Number of census children, 759. State apportionment, August 1, 1874, $493 35. Minimnm amount of school fund needed for 1874-5, $6,000. Amount of State school fund for 1873-4, $1,745 60. Amount to be raised from county

school tax, $4,483. Probable amount of State school fund for 1874-5, $5,692 50. Amount to be raised from county school tax, $2,277.

Cummings' Valley	66	1	500	p. r.	41 11
Fitzgerald	39	1	500		41 11
Havilah	15	1	500		41 11
Kern Island	294	3	1500	p. r.	123 33
Kernville	62	1	500	p. r.	41 11
Linns Valley	121	2	1000	p. r.	82 22
Tehachipa	94	1	500	p. r.	41 11
Weldon	31	1	500		41 11
Wicker	37	1	500		44 11
	756	12	6,000		493 32

KLAMATH.

Number of census children, 291. State apportionment, August 1, 1874, $189 15. Minimum amount of school fund needed for 1874-5, $2,500. Amount of State school fund for 1873-4, $874 04. Amount to be raised from county school tax, $1,756. Probable amount of State school fund for 1874-5, $2,182 50. Amount to be raised from county school tax, $873.

Klamath	80	1	500	p. r.	37 83
	71	1	500	p. r.	37 83
	59	1	500	p. r.	37 83
	29	1	500		37 83
	52	1	500	p. r.	37 84
	291	5	2,500		189 15

LAKE.

Number of census children, 1,214. State apportionment, August 1, 1874, $789 10. Minimum amount of school fund needed for 1874-5, $12,000. Amount of State school fund for 1873-4, $3,096 83. Amount to be raised from county school tax, $9,213. Probable amount of State school fund for 1874-5, $9,105. Amount to be raised from county school tax, $3,806.

Morgan Valley	22	1	500		32 87
Lower Lake	104	1	500	p. r.	32 87
Burns' Valley	33	1	500		32 87
Excelsior	24	1	500		32 87
Loconomi	92	1	500	p. r.	32 87
Rincon	47	1	500		32 87
Uncle Sam	81	1	500	p. r.	32 87
Kelsey Creek	51	1	500	p. r.	32 87
Big Valley	32	1	500		32 87
Pleasant Grove	60	1	500	p. r.	32 87
Upper Lake	169	2	1000	p. r.	65 74
Bachelor Valley	68	1	500	p. r.	32 87
Blue Lake	30	1	500		32 87
Cobb Valley	27	1	500		32 87
Middletown	140	2	1000	p. r.	65 74

Spruce Grove	29	1	500		32 87
Ashland	35	1	500		32 87
Gravelly Valley	19	1	500		32 87
Mountain	28	1	500		32 87
Scott's Valley	37	1	500		32 87
Lakeport	116	2	1000		65 74
	1,214	24	12,000		788 78

LASSEN.

Number of census children, 663. State apportionment, August 1, 1875, $430 95. Minimum amount of school fund needed for 1874-5, $6,000. Amount of State School fund for 1873-4 ,$1,596 22. Amount to be raised from county school tax, $4,563. Probable amount of State school fund for 1874-5, $4,972 50. Amount to be raised from county school tax, $1,989.

Susanville	186	2	1000	p. r.	71 82
Susan River	59	1	500	p. r.	35 91
Janesville	44	1	500		35 91
Lake	52	1	500	p. r.	35 91
Milford	47	1	500		35 91
Long Valley	28	1	500		35 91
Soldiers' Bridge	27	1	500		35 91
Willow Creek	45	1	500		35 91
Providence	91	1	500	p. r.	35 91
Pleasant Butte	50	1	500	p. r.	35 91
Washington	34	1	500		35 91
	663	12	6,000		430 92

MARIN.

Number of census children, 1,636. State apportionment, August 1, 1874, $1,063 40. Minimum amount of school fund needed for 1874-5, $15,000. Amount of State school fund for 1873-4, $4,375 94. Amount to be raised from county school tax, $11,062. Probable amount of State school fund for 1874-5, $12,270. Amount to be raised from county school tax, $4,908.

American Valley	24	1	500		35 44
Aurora	60	1	500	p. r.	35 44
Bolinas	33	1	500		35 44
Bay	76	1	500	p. r.	35 44
Chileno Valley	50	1	500	p. r	35 44
Clark	55	1	500	p. r.	35 44
Dixie	259	3	1500	p. r.	106 32
Estero	34	1	500		35 44
Franklin	22	1	500		35 44
Garcia	51	1	500	p. r.	35 44
Halleck	28	1	500		35 44
Laguna	25	1	500		35 44
Lincoln	15	1	500		35 44
Nicacio	79	1	500	p. r.	35 44
Novato	52	1	500	p. r.	35 44
Olema	22	1	500		35 44
Point Reyes	42	1	500		35 44

Ross Landing	68	1	500	p. r.	35 44
Richardson	63	1	500	p. r.	35 44
San Rafael	347	4	2000	p. r.	141 76
Saucelito	55	1	500	p. r.	35 44
San Quentin	43	1	500		34 44
San Antonio	38	1	500		35 44
San Jeronimo	20	1	500		35 44
Tomales	75	1	500	p. r.	35 44
	1,636	30	15,000		1,063 20

MARIPOSA.

Number of census children, 890. State apportionment, August 1, 1874, $578 50. Minimum amount of school fund needed for 1874–5, $7,700. Amount of State school fund for 1873–4, $2,849 38. Amount to be raised from county school tax, $5,136. Probable amount of State school fund for 1874–5, $6,675. Amount to be raised from county school tax, $2,670.

Mariposa	118	2	1000	p. r.	75 12
Hornitos	140	2	1000	p. r.	75 12
Bear Valley	77	1	500	p. r.	37 56
Coulterville	85	1	500	p. r.	37 56
Granite Springs	30	1	500		37 56
Quartzburg	50	1	500	p. r.	37 56
Elk Horn	43	1	500		37 56
Cathay's Valley	62	1	500	p. r.	37 76
Princeton	31	1	500		37 56
Pea Ridge	60	1	500	p. r.	37 56
Sherlock's	30	1	500		37 56
Yosemite	69	1	500	p. r.	37 56
Sebastopol	77	1	500	p. r.	37 56
[Joint Dist. with Merced Falls, Merced.]					
Merced Falls	18	2-5ths	200		15 02
	890	15 2-5	7.700		578 42

MENDOCINO.

Number of census children, 2,648. State apportionment, August 1, 1874, $1,721 20. Minimum amount of school fund needed for 1874–5, $24,500. Amount of State school fund for 1873–4, $7,303 01 Amount to be raised from county school tax, $17,846. Probable amount of State school fund for 1874–5, $19,860. Amount to be raised from county school tax, $7,944.

Anderson	90	1	500	p. r.	35 12
Albion	15	1	500		35 12
Big River	84	1	500		35 12
Bridgeport	50	1	500		35 12
Buchanan	135	2	1000	p. r.	70 24
Big Rock	24	1	500		35 12
Chato	45	1	500		35 12
Calpella	22	1	500		35 12
Caspar	36	1	500		35 12
Central	67	1	500		35 12
Counts	39	1	500		35 12

Cayote	32	1	500		35 12
Cuffey's Cove	40	1	500		35 12
Eel River	60	1	500	p. r.	35 12
Fish Rock	45	1	500		35 12
Farley	72	1	500	p. r.	35 12
Gaskill	42	1	500		35 12
Gualala	33	1	500		35 12
Galloway	40	1	500		35 12
Indian Creek	34	1	500		35 12
Little Lake	51	1	500	p. r.	35 12
Little River	30	1	500		35 12
Lima	19	1	500		35 12
Long Valley	48	1	500		35 12
Manchester	126	2	1000	p. r.	70 24
Mill Creek	59	1	500	p. r.	35 12
Nevarro	37	1	500		35 12
Noyo	19	1	500		35 12
Ocean	24	1	500		35 12
Oriental	70	1	500	p. r.	35 12
Potter Valley	50	1	500	p. r.	35 12
Prairie Camp	34	1	500		35 12
Rancheria	70	1	500	p. r.	35 12
Redwood	51	1	500	p. r.	35 12
Round Valley	125	2	1000	p. r.	70 24
Sanel	96	1	500	p. r.	35 12
Sherwood	62	1	500	p. r.	35 12
Ten Mile River	62	1	500	p. r.	35 12
Ukiah	370	4	2000	p. r.	140 48
Union	60	1	500	p. r.	35 12
Upper Little Lake	78	1	500	p. r.	35 12
Walker Valley	30	1	500		35 12
Willitsville	72	1	500	p. r.	35 12
	2,648	49	24,500		1,720 88

MERCED.

Number of census children, 1,182. State apportionment, August 1, 1874, $786 30. Minimum amount of school fund needed for 1874–5, $10,800. Amount of State school fund for 1873–4, $2,811 77. Amount to be raised from county school tax, $8,269. Probable amount of State school fund for 1874–5, $8,865. Amount to be raised from county school tax, $3,546.

Anderson	50	1	500	p. r.	35 56
Bear Creek	27	1	500		35 56
Clay	57	1	500	p. r	35 56
Eden	21	1	500		35 56
Fair View	32	1	500		35 56
Hopeton	36	1	500		35 56
Jefferson	59	1	500	p. r.	35 56
Lone Tree	46	1	500		35 56
Los Baños	95	1	500	p. r.	35 56
Maddison	32	1	500		35 56
Monroe	52	1	500	p. r.	35 56
Mariposa	74	1	500	p. r.	35 56
McSwain	38	1	500		35 56
Merced	248	3	1500	p. r.	106 68

Pioneer	32	1	500	35 56
Plainsburg	60	1	500 p. r.	35 56
Snelling	86	1	500 p. r.	35 56
Washington	43	1	500	35 56
San Louis	67	1	500 p. r.	35 56
[Joint Dist. with Merced Falls, Mariposa.]				
Merced Falls	27	3-5ths	300	21 33
	1.182	21 3-5	10,000	768 09

MONO.

Number of census children, 104. State apportionment, August 1, 1874, $67 60. Minimum amount of school fund needed for 1874-5, $2,000. Amount of State school fund for 1873-4, $272 04. Amount to be raised from county school tax, $1,755. Probable amount of State school fund for 1874-5, $780. Amount to be raised from county school tax, $1,298.

Antelope	29	1	500	16 90
North Antelope	15	1	500	16 90
Benton	24	1	500	16 90
Bridgeport	36	1	500	16 90
	104	4	2,000	67 60

MONTEREY.

Number of census children, 2,861. State apportionment, August 1, 1874, $1,859 65. Minimum amount of school fund needed for 1874-5, $19,651 26. Amount of State school fund for 1873-4, 10,952 07. Amount to be raised from county school tax, $9,794. Probable amount of State school fund for 1874-5, $21,457 50. Amount to be raised from county school tax, $8,583.

Alisal	71	1	500 p. r.	47 19
Bernabe	61	1	500 p. r.	47 19
Carmelo	102	1	500 p. r.	47 19
Carrolton	82	1	500 p. r.	47 19
Castroville	257	3	1500 p. r.	141 57
El Sansal	28	1	500	47 19
Gonzalez	103	1	500 p. r.	47 19
Jacks	24	1	500	47 19
Lindley	102	1	500 p. r.	47 19
Monterey	345	4	2000 p. r.	188 76
Mountain	80	1	500 p. r.	47 19
Natividad	118	2	1000 p. r.	94 38
Oak Grove	75	1	500 p. r.	47 19
Rincon	55	1	500 p. r.	47 19
Red Rock	75	1	500 p. r.	47 19
Salinas City	388	4	2000 p. r.	188 76
San Antonio	114	1	500 p. r.	47 19
San Miguel	55	1	500 p. r.	47 19
Santa Rita	137	2	1000 p. r.	94 38
Soledad	106	1	500 p. r.	47 19
Spring	32	1	500	47 19
Shearer	33	1	500	47 19
Springfield	44	1	500	47 19

Sycamore Spring	58	1	500	p. r.	47 19
Washington	126	2	1000	p. r.	94 38
Carneros	63	1	500	p. r.	47 19
Long Valley	77	1	500	p. r.	47 19
[Joint Dist. with Peach Tree, San Benito.]					
Peach Tree	30	3-5ths	294 12		28 31
[Joint Dist. with Priest Valley, S. Benito.]					
Priest Valley	20	4-5ths	357 14		37 75
	2,861	29 2-5	19,651 26		1.859 28

NAPA.

Number of census children, 2,599. State apportionment, August 1, 1874, $1,689 35. Minimum amount of school fund needed for 1874–5, $23,650. Amount of State school fund for 1873–4, $6,398 83. Amount to be raised from county school tax, $17,891. Probable amount of State school fund for 1874–5, $19,492 50. Amount to be raised from county school tax, $7,797.

Buchanan	115	2	1000	p. r.	71 42
Beryessa	50	1	500	p. r.	35 71
Bennett	62	1	500	p. r.	35 71
Carnaros	53	1	500	p. r.	35 71
Calistoga	161	2	1000	p. r.	71 42
Chiles	56	1	500	p. r.	35 71
Cherry Valley	23	1	500		35 71
Cappelle Valley	27	1	500		35 71
Chiles Valley	22	1	500		35 71
Conn Valley	22	1	500		35 71
Cinnabar	72	1	500	p. r.	35 71
Franklin	17	1	500		35 71
Foss Valley	19	1	500		35 71
Gorton Valley	28	1	500		35 71
Howard	37	1	500		35 71
Harmony	61	1	500	p. r.	35 71
Jefferson	40	1	500		35 71
Liberty	56	1	500	p r.	35 71
Lodi	44	1	500		35 71
Napa City	750	8	4000	p. r.	285 68
Oakville	29	1	500		35 71
Oak Grove	28	1	500		35 71
Pope Valley	57	1	500	p. r.	35 71
Putah	33	1	500		35 71
Redwood	86	1	500	p. r.	35 71
Suscol	30	1	500		35 71
St. Helena	265	3	1500	p. r.	107 13
Soda Cañon	31	1	500		35 71
Salvador	36	1	500		35 71
Sulphur Springs	36	1	500		35 71
Spring Mountain	32	1	500		35 71
Tucker	33	1	500		35 71
Upper Pope Valley	38	1	500		35 71
Vineland	66	1	500	p. r.	35 71
Wooden Valley	30	1	500		35 71
Yount	30	1	500		35 71
[Joint District with Mountain, Solano.]					
Mountain	9	$\frac{3}{10}$	150		10 71
	2,599	$47\frac{3}{10}$	23,650		1,689 08

NEVADA.

Number of census children, 4,532. State apportionment, August 1, 1874, $2,945 80. Minimum amount of school fund needed for 1874-5, $32,000. Amount of State school fund for 1873-4, $12,690 20. Amount to be raised from county school tax, $20,579. Probable amount of State school fund for 1874-5, $33,990. Amount to be raised from county school tax, $13,596.

Allison Ranch	188	2	1000	p. r.	92 04
Boca	24	1	500		46 02
Birchville	65	1	500	p. r.	46 02
Blue Tent	32	1	500		46 02
Bear River	26	1	500		46 02
Chalk Bluff	49	1	500		46 02
Clear Creek	60	1	500	p. r.	46 02
Cherokee	69	1	500	p. r.	46 02
Columbia Hill	74	1	500	p. r.	46 02
Eureka	93	1	500	p. r.	46 02
Forest Springs	132	2	1000	p. r.	92 04
French Corral	87	1	500	p. r.	46 02
Grass Valley	952	10	5000	p. r.	460 20
Graniteville	20	1	500		46 02
Greeley	22	1	500		46 02
Indian Springs	70	1	500	p. r.	46 02
Kentucky Flat	86	1	500	p. r.	46 02
Little York	50	1	500	p. r.	46 02
Lime Kiln	25	1	500		46 02
Liberty Hill	32	1	500		46 02
Lake City	41	1	500		46 03
Moore's Flat	89	1	500	p. r.	46 02
Mooney Flat	62	1	500	p. r.	46 02
Nevada	795	8	4000	p. r.	368 16
North San Juan	169	2	1000	p. r.	92 04
North Bloomfield	123	2	1000	p. r.	92 04
North Star	127	2	1000	p. r.	92 04
Oakland	117	2	1000	p. r.	92 04
Onega	50	1	500	p. r.	46 02
Pleasant Valley	44	1	500		46 02
Quaker Hill	31	1	500		46 02
Rough and Ready	87	1	500	p. r.	46 02
Relief Hill	29	1	500		46 02
Sebastopol	53	1	500	p. r.	46 02
Spencerville	36	1	500		46 02
Sweetland	86	1	500	p. r.	46 02
Truckee	209	2	1000	p. r.	92 04
Union Hill	130	2	1000	p. r.	92 04
Washington	45	1	500		46 02
Willow Valley	53	1	500	p. r.	46 02
	4,532	64	32,000		2,945 28

PLACER.

Number of census children, 2,426. State apportionment, August 1, 1874, $1,576 90. Minimum amount of school fund needed for 1874-5, $24,376 30. Amount of State school fund for 1873-4, $6,657 96. Amount to be raised from county school tax, $18,383. Probable amount of State school fund for 1874-5, $18,195. Amount to be raised from county school tax, $8,001.

Auburn	220	3	1500	p. r.	96 54
Alta	41	1	500		32 18

Bath	42	1	500		32 18
Blue Cañon	25	1	500		32 18
Central	30	1	500		32 18
Christian Valley	39	1	500		32 18
Coon Creek	28	1	500		32 18
Colfax	156	2	1000	p. r.	64 36
Dane Town	27	1	500		32 18
Deadwood	12	3-5ths	300		19 31
Dutch Flat	203	2	1000	p. r.	64 36
Damascus	24	1	500		32 18
Emigrant Gap	17	1	500		32 18
Excelsior	20	1	500		32 18
Franklin	30	1	500		32 18
Forest Hill	159	2	1000	p. r.	64 36
Gold Hill	29	1	500		32 18
Gold Run	96	1	500	p. r.	32 18
Iowa Hill	101	1	500	p. r.	32 18
Lisbon	35	1	500		32 18
Lincoln	59	1	500	p. r.	32 18
Lone Star	26	1	500		32 18
Michigan Bluff	61	1	500	p. r.	32 18
Mt. Pleasant	41	1	500		32 18
Neilsburg	37	1	500		32 18
Newcastle	54	1	500	p. r.	32 18
Norwich	47	1	500		32 18
Ophir	131	2	1000	p. r.	64 36
Penryn	51	1	500	p. r.	32 18
Pleasant Grove	19	1	500		32 18
Rock Creek	51	1	500	p. r.	32 18
Rocklin	128	2	1000	p. r.	64 36
Roseville	72	1	500	p. r.	32 18
Smithville	25	1	500		32 18
Spring Garden	31	1	500		32 18
Todd's Valley	34	1	500		32 18
Valley View	25	1	500		32 18
Wisconsin Hill	37	1	500		32 18
Washington	29	1	500		32 18
Yankee Jim's	34	1	500		32 18
[Joint Dist. with Antelope, Sacramento.]					
Dry Creek	20	3-5ths	285 71		19 31
[Joint District with Fair View, Sutter.]					
Fair View	12	2-5ths	162 17		12 87
[Joint Dist. with Wild Goose, El Dorado.]					
Rattlesnake	42	4-5ths	368 42		25 74
[Joint District with Center, Sacramento.]					
Union	26	3-5ths	260		19 31
	2426	49	24,376 30		1,576 82

PLUMAS.

Number of census children, 702. State apportionment, August 1, 1874, $514 80. Minimum amount of school fund needed for 1874-5, $10,672 92. Amount of State school fund for 1873-4, $2,271 03. Amount to be raised from county school tax, $8,629. Probable amount of State school fund for 1874-5, $5,940. Amount to be raised from county school tax, $5,327.

Beckworth	33	1	500		24 05
Big Meadows	13	3-5ths	300		14 43
Butterfly Valley	20	1	500		24 05

Crescent	66	1	500	p. r.	24 05
Clover Valley	16	1	500		24 05
Gleenville	74	1	500	p. r.	24 05
Hot Spring	28	1	500		24 05
Island	21	1	500		24 05
Lincoln	23	1	500		24 05
La Porte	119	2	1000	p. r.	48 10
Lassen Buttes	17	1	500		24 05
Mohawk	24	1	500		24 05
Pioneer	30	1	500		24 05
Pilot Peak	14	3-5ths	300		14 43
Quincy	80	1	500	p. r.	24 05
Summit	23	1	500		24 05
Sulphur Spring	21	1	500		24 05
Seneca	10	3-5ths	300		14 43
Spanish Peak	41	1	500		24 05
Taylor	74	1	500	p. r.	24 05
Union	18	1	500		24 05
[Joint Distict with Antelope, Sierra.]					
Antelope	14	2.5ths	200		9 62
[Joint District with Rocky Point, Sierra.]					
Rocky Point	7	1-5th	72 92		4 81
	792	21 2/5	10,672 92		514 67

SACRAMENTO.

Number of census children, 6,124. State apportionment, August 1, 1874, $3,980 60. Minimum amount of school fund needed for 1874-5, $45,722 71. Amount of State school fund for 1873-4, $16,707 79. Amount to be raised from county school tax, $30,685. Probable amount of State school fund for 1874-5, $45,930. Amount to be raised from county school tax, $18,372.

Alabama	57	1	500	p. r.	43 64
American	16	1	500		43 64
American River	98	1	500	p. r.	43 64
Ashland	27	1	500		43 64
Brannan	31	1	500		43 64
Brighton	30	1	500		43 64
Buckeye	31	1	500		43 64
Carson Creek	42	1	500		43 64
Davis	19	1	500		43 64
Dry Creek	15	1	500		43 64
Elder Creek	52	1	500	p. r.	43 64
Elk Grove	62	1	500	p. r.	43 64
Enterprise	73	1	500	p. r.	43 64
Excelsior	51	1	500	p. r.	43 64
Franklin	59	1	500	p. r.	43 64
Freeport	46	1	500		43 64
Galt	58	1	500	p. r.	43 64
Georgiana	40	1	500		43 64
Granite	135	2	1000	p. r.	87 28
Grant	31	1	500		43 64
Hicksville	37	1	500		43 64
Homewood	13	3-5ths	300		26 18
Jackson	31	1	500		43 64
Katesville	27	1	500		43 64
Kinney	84	1	500	p. r.	43 64
Laguna	8	.....	.....		.....
Lee	16	1	500		43 64

Lincoln	30	1	500		43 64
Lisbon	35	1	500		43 64
Michigan Bar	79	1	500	p. r.	43 64
Mokelumne	33	1	500		43 64
Oak Grove	26	1	500		43 64
Onisbo	56	1	500		43 64
Pacific	30	1	500		43 64
Pleasant Grove	84	1	500	p. r.	43 64
Point Pleasant	37	1	500		43 64
Prairie	35	1	500		43 64
Rhoades	24	1	500		43 64
Richland	33	1	500		43 64
San Joaquin	67	1	500	p. r.	43 64
Sherman	45	1	500		43 64
Stone House	29	1	500		43 64
Sutter	88	1	500	p. r.	43 64
Sylvan	77	1	500	p. r.	43 64
Sacramento	3755	38	19,000	p. r.	1,658 32
Union	30	1	500		43 64
Viola	44	1	500		43 64
Washington	71	1	500	p. r.	43 64
Walnut Grove	31	1	500		43 64
White Rock	41	1	500		43 64
Wilson	33	1	500		43 64
West Union	35	1	500		43 64
Emmaton	17	1	500		43 64
[Joint District with Union, Placer.]					
Center	24	2-5ths	240		17 45
[Joint District with Dry Creek, Placer.]					
Antelope	15	2-5ths	214 29		17 45
[Joint Dist. with Hutson, San Joaquin.]					
Hutson	12	3-5ths	285 72		26 18
[Joint District with Natoma, El Dorado.]					
Natoma	19	1-5ths	182 70		8 72
	6.124	$91\frac{1}{5}$	45.722 71		3.979 94

SAN BENITO.

Number of census children, 1,339. State Apportionment, August 1, 1874, $870 35. Minimum amount of school fund needed for 1874-5, $10,455 88. Amount of State school fund for 1873-4, ————. Amount to be raised from county school tax, $————. Probable amount of State school fund for 1874-5, $10,042 50. Amount to be raised from county school tax, $——.

Hollister	325	4	2000	p. r.	167 36
Bear Valley	30	1	500		41 84
Jefferson	96	1	500	p. r.	41 84
San Juan	251	3	1500	p. r.	125 52
Gabilan	25	1	500		41 84
San Benito	76	1	500	p. r.	41 84
Live Oak	50	1	500	p. r.	41 84
Pacheco	62	1	500	p. r.	41 84
Erie	47	1	500		41 84
Santa Ana	79	1	500	p. r.	41 84
Tres Pinos	142	2	1000	p. r.	83 68
Lone Tree	38	1	500		41 84
Fair View	55	1	500	p. r.	41 84
Union	25	1	500		41 84
[Joint Dist. with San Felipe, Santa Clara.]					

San Felipe	9	1-5th	107 14	8 38
[Joint Dist. with Priest Valley, Monterey.]				
Priest Valley	8	1-5th	142 86	8 38
[Joint Dist. with Peach Tree, Monterey.]				
Peach Tree	21	2-5ths	205 88	16 77
	1,339	20 4/5	10,455 88	870 33

SAN BERNARDINO.

Number of census children, 1,825. State apportionment, August 1, 1874, $1,186 25. Minimum amount of school fund needed for 1874-5, $13,000. Amount of State school fund for 1873-4, $4,781 32. Amount to be raised from county school tax, $8,697. Probable amount of State school fund for 1874-5, $13,687 50. Amount to be raised from county school tax, $5,475.

American	55	1	500	p. r.	45 62
Central	52	1	500	p. r.	45 62
Chino	156	2	1000	p. r.	91 24
City	350	4	2000	p. r.	182 48
City Creek	51	1	500	p. r.	45 62
Cram	35	1	500		45 62
Cucamunga	55	1	500	p. r.	45 62
Jampa	44	1	500		45 62
Juapa	39	1	500		45 62
Mill	55	1	500	p. r.	45 62
Mission	114	1	500	p. r.	45 62
Mt. Vernon	164	2	1000	p. r.	91 25
New Chino	39	1	500		45 62
Riley	90	1	500	p. r.	45 62
Riverside	81	1	500	p. r.	45 62
San Salvador	175	2	1000	p. r.	91 24
San Timeteo	91	1	500	p. r.	45 62
Temescal	42	1	500		45 62
Warm Spring	83	1	500	p. r.	45 62
Washington	54	1	500	p. r.	45 62
	1,825	26	13,000		1.186 12

SAN DIEGO.

Number of census children, 1,728. State apportionment, August 1, 1874, $1,123 20. Minimum amount of school fund needed for 1874-5. $13,500. Amount of State school fund for 1873-4, $4,046 05. Amount to be raised from county school tax, $9,859. Probable amount of State school fund for 1874-5, $12,960. Amount to be raised from county school tax, $5,184.

Ballena	45	1	500		41 60
Banner	32	1	500		41 60
Bear Valley	72	1	500	p. r.	41 60
Cajou	59	1	500	p. r.	41 60
East San Diego	89	1	500	p. r.	41 60
Hope	28	1	500		41 60
Jamul	28	1	500		41 60
Julian	87	1	500	p. r.	41 60
Milquatay	18	1	500		41 60
Monserate	65	1	500	p. r.	41 60
Mount Fair View	57	1	500	p. r.	41 60
National	22	1	500		41 60

New San Diego...	457	5	2500	p. r.	208 00
Poway	41	1	500		41 60
Potrero	57	1	500	p. r.	41 60
San Diego	278	3	1500	p. r.	124 80
San Jacinto	58	1	500	p. r.	41 60
San Luis Rey	96	1	500	p. r.	41 60
San Dieguito	17	1	500		41 60
Temecula	92	1	500	p. r.	41 60
Monument	30	1	500		41 60
	1,728	27	13,500		1,123 20

SAN FRANCISCO.

Number of census children, 38,093. State apportionment, August 1, 1874, $24,760 45. Probable amount of State school fund for 1874–5, $285,697 50.

SAN JOAQUIN.

Number of census children, 5,085. State apportionment, August 1, 1874, $3,305 25. Minimum amount of school fund needed for 1874–5, $44,500 45. Amount of State school fund for 1873–4, $14,278 85. Amount to be raised from county school tax, $31,649. Probable amount of State school fund for 1874–5, $38,137 50. Amount to be raised from county school tax, $15,255.

Augnst	49	1	500		37 13
Athearn	66	1	500	p. r.	37 13
Alpine	30	1	500		37 13
Brunswick	53	1	500	p. r.	37 13
Burwood	36	1	500		37 13
Bellota	67	1	500	p. r.	37 13
Calaveras	33	1	500		37 13
Corral Hollow	23	1	500		37 13
Castle	33	1	500		37 13
Chartville	34	1	500		37 13
Charity Dale	16	1	500		37 13
Columbia	42	1	500		37 13
Davis	52	1	500	p. r.	37 13
Douglass	33	1	500		37 13
Dry Creek	24	1	500		37 13
Delphi	71	1	500	p. r.	37 13
Duck Lake	15	1	500		37 13
Elliott	46	1	500		37 13
Elkhorn	32	1	500		37 13
Everett	47	1	500		37 13
Enterprise	17	1	500		37 13
French Camp	46	1	500		37 13
Franklin	37	1	500		37 13
Fairview	19	1	500		37 13
Greenwood	46	1	500		37 13
Grant	53	1	500	p. r.	37 13
Henderson	53	1	500	p. r.	37 13
Harmony Grove	58	1	500	p. r.	37 13
Houston	94	1	500	p. r.	37 13
Jefferson	44	1	500		37 13
Linden	138	2	1000	p. r.	74 26
Liberty	52	1	500	p. r.	37 13
Live Oak	30	1	500		37 13
Lincoln	26	1	500		37 13

Lone Tree	17	1	500		37 13
Lafayette	37	1	500		37 13
Lockeford	98	1	500	p. r.	37 13
Moore	36	1	500		37 13
Madison	52	1	500	p. r.	37 13
Montezuma	31	1	500		37 13
Mokelumne	16	1	500		37 13
Mt. Carmel	41	1	500		37 13
McKamy	51	1	500	p. r.	37 13
New Jerusalem	50	1	500	p. r.	37 13
New Hope	30	1	500		37 13
North	48	1	500		37 13
Pacific	22	1	500		37 13
Rustic	24	1	500		37 13
River	27	1	500		37 13
Stockton	1966	20	10000		742 60
South	30	1	500		37 13
Salem	101	1	500		37 13
Shay Grove	36	1	500		37 13
San Joaquin	24	1	500		37 13
Telegraph	58	1	500	p. r.	37 13
Tulare	59	1	500	p. r.	37 13
Turner	50	1	500	p. r.	37 13
Union	57	1	500	p. r.	37 13
Valley,	98	1	500	p. r.	37 13
Van Allen	60	1	500	p. r.	37 13
Woods	77	1	500	p. r.	37 13
Wheatland	27	1	500		37 13
Washington	43	1	500		37 13
Wildwood	63	1	500	p. r.	37 13
Weber	40	1	500		37 13
Willow	70	1	500	p. r.	37 13
Zinc House	61	1	500	p. r.	37 13
[Joint Dist. with Central, Stanislaus.]					
Central ?	8	.....	.....		.....
[Joint Dist. with Home Union, Stanisl's.]					
Home	23	⅔	294 87		24 75
[Joint Dist. with Hutson, Sacramento.]					
Hutson	9	⅓	214 28		12 37
[Joint Dist. with Rising Sun, Stanislaus.]					
Rising Sun	14	⅓	151 30		12 37
[Joint Dist with Midway, Alameda.]					
Midway	16	⅔	340		24 75
	5,085	89	44,500 45		3,304 55

SAN LUIS OBISPO.

Number of census children, 1,843. State apportionment, August 1, 1874, $1,197 95. Minimum amount of school fund needed for 1874-5, $15,500 00. Amount of State school fund for 1873-4, $4,792 87. Amount to be raised from county school tax, $11,186. Probable amount of State school fund for 1874-5, $13,822 50. Amount to be raised from county school tax, $5,529.

Arroyo Grande	165	2	1000	p. r.	77 28
Central	45	1	500		38 64
Excelsior	62	1	500	p. r.	38 64
Estrella	37	1	500		38 64
Estero	26	1	500		38 64
Franklin	45	1	500		38 64

Hesperian	78	1	500	p. r.	38 64
Hope	57	1	500	p. r.	38 64
Home	54	1	500	p. r.	38 64
Josephine	54	1	500	p. r.	38 64
Los Osos	36	1	500		38 64
Los Tablos	46	1	500		38 64
Mission	431	5	2500	p. r.	193 20
Mammoth Rock	28	1	500		38 64
Olmsted	54	1	500	p. r.	38 64
Oso Flaco	48	1	500		38 64
Santa Fé	188	2	1000	p. r.	77 28
Santa Rosa	42	1	500		38 64
San José	118	2	1000	p. r.	77 28
San Miguel	26	1	500		38 64
Salinas	51	1	500	p. r.	38 64
San Simeon	45	1	500		38 64
Summit	57	1	500	p. r.	38 64
Washington	50	1	500	p. r.	38 64
	1,843	31	15,500		1,197 84

SAN MATEO.

Number of census children, 2,115. State apportionment, August 1, 1874, $1,374 75. Minimum amount of school fund needed for 1874-5, $16,500. Amount of State school fund for 1873-4, $5,975 50. Amount to be raised from county school tax, $10,525. Probable amount of State school fund for 1874-5, $15,862 50. Amount to be raised from county school tax, $6,345.

Alpine	36	1	500		41 65
La Honda	23	1	500		41 65
Belmont	48	1	500		41 65
Greersburg	56	1	500	p. r.	41 65
Half Moon Bay	359	4	2000	p. r.	166 60
Jefferson	78	1	500	p. r.	41 65
Laguna	81	1	500	p. r.	41 65
Millbrae	38	1	500		41 65
New Bell	32	1	500		41 65
Pescadero	71	1	500	p. r.	41 65
Pharis	20	1	500		41 65
Pigeon Point	42	1	500		41 65
Pompania	18	1	500		41 65
Purissima	105	1	500	p. r.	41 65
Redwood City	546	6	3000	p. r.	249 90
San Bruno	81	1	500	p. r.	41 65
San Gregorio	24	1	500		41 65
San Mateo	201	2	1000	p. r.	83 30
San Pedro	59	1	500	p. r.	41 65
San Reymundo	18	1	500		41 65
Searsville	94	1	500	p. r.	41 65
Seaside	23	1	500		41 65
Tunis	44	1	500		41 65
West Union	18	1	500		41 65
	2,115	33	16,500		1,374 45

SANTA BARBARA.

Number of census children, 1,918. State apportionment, August 1, 1874, $1,246 70. Minimum amount of school fund needed for 1874-5, $11,500.

Amount of State school fund for 1873–4, $5,017 16. Amount to be raised from county school tax, $6,985. Probable amount of State school fund for 1874–5, $14,385. Amount to be raised from county school tax, $5,754.

Santa Barbara	959	10	5000	p. r.	542 00
Montecito	152	2	1000	p. r.	108 40
Carpenteria	72	1	500	p. r.	54 20
Rafaela	180	2	1000	p. r.	108 40
Graciosa	100	1	500	p. r.	54 20
Hope	96	1	500	p. r.	54 20
Pine Grove	74	1	500	p. r.	54 20
Guadalupe	83	1	500	p. r.	54 20
Ocean	29	1	500		54 20
Rincon	32	1	500		54 20
Laguna	47	1	500		54 20
Santa Maria	94	1	500	p. r.	54 20
	1,918	23	11,500		1,246 60

SANTA CLARA.

Number of census children, 7,724. State apportionment, August 1, 1874, $5,020 60. Minimum amount of school fund needed for 1874–5, $48,580 36. Amount of State School fund for 1873–4, $20,356 78. Amount to be raised from county school tax, $30,259. Probable amount of State school fund for 1874–5, $57,930. Amount to be raised from county school tax, $23,127.

Adams	81	1	500	p. r.	51 75
Alviso	152	2	1000	p. r.	103 50
Berryessa	67	1	500	p. r.	51 75
Braly	61	1	500	p. r.	51 75
Burnett	47	1	500		51 75
Calaveras	27	1	500		51 75
Cambrian	65	1	500	p. r.	51 75
Carneadero	59	1	500	p. r.	51 75
Collins	44	1	500		51 75
Eagle	59	1	500	p. r.	51 75
Encinal	38	1	500		51 75
Evergreen	104	1	500	p. r.	51 75
Franklin	49	1	500		51 75
Gilroy	486	5	2500	p. r.	258 75
Guadalupe	83	1	500	p. r.	51 75
Hacienda	99	1	500	p. r.	51 75
Hamilton	76	1	500	p. r.	51 75
Hester	351	4	2000	p. r.	207 00
Highland	58	1	500	p. r.	51 75
Hill	297	3	1500	p. r.	155 25
Jackson	70	1	500	p. r.	51 75
Jefferson	90	1	500	p. r.	51 75
Laguna	32	1	500		51 75
Lexington	41	1	500		51 75
Live Oak	65	1	500	p. r.	51 75
Llagas	72	1	500	p. r.	51 75
Los Gatos	84	1	500	p. r.	51 75
Lincoln	57	1	500	p. r.	51 75
Mayfield	260	3	1500	p. r.	155 25
Millikin	52	1	500	p. r.	51 75
Milpitas	127	2	1000	p. r.	103 50
Mooreland	67	1	500	p. r.	51 75

Mountain View	146	2	1000	p. r.	103 50
Mt. Pleasant	34	1	500		51 75
Midway	47	1	500		51 75
Oak Grove	92	1	500	p. r.	51 75
Orchard Street	130	2	1000	p. r.	103 50
Pala	105	1	500	p. r.	51 75
Pioneer	87	1	500	p. r.	51 75
Rhodes	64	1	500	p. r.	51 75
Saratoga	119	2	1000	p. r.	103 50
San Antonio	46	1	500		51 75
Santa Clara	547	6	3000	p. r.	310 50
San José	2493	25	12500	p. r.	1293 75
San Ysidro	134	2	1000	p. r.	103 50
Sierra	33	1	500		51 75
Silver Creek	40	1	500		51 75
Union	61	1	500	p. r.	51 75
Whisman	65	1	500	p. r.	51 75
Willow Glen	107	1	500	p. r.	51 75
[Joint District with San Felipe, S. Benito.]					
San Felipe	33	½	392 86		34 50
[Joint Dist. with Summit, Santa Cruz.]					
Summit	21	½	187 50		17 25
	7,724	97	48,580 36		5,019 75

SANTA CRUZ.

Number of census children, 3,008. State apportionment, August 1, 1874, $1,955 20. Minimum amount of school fund needed for 1874-5, $22,812 50. Amount of State school fund for 1873-4, $8,180 43. Amount to be raised from county school tax, $15,450. Probable amount of State school fund for 1874-5, $22,560. Amount to be raised from county school tax, $9,024.

Santa Cruz	866	9	4500	p. r.	385 83
Pajaro	652	7	3500	p. r.	300 09
San Andreas	68	1	500	p. r.	42 87
Mountain	42	1	500		42 87
Corralitor	153	2	1000	p. r.	85 74
Petroleum	20	1	500		42 87
Happy Valley	57	1	500	p. r.	42 87
Hazel Brook	18	1	500		42 87
El Jarro	44	1	500		42 87
Railroad	34	1	500		42 87
Scott's Valley	33	1	500		42 87
San Lorenzo	65	1	500	p. r.	42 87
Bay View	116	2	1000	p. r.	85 74
Green Valley	63	1	500	p. r.	42 87
Carlton	52	1	500	p. r.	42 87
Soquel	219	3	1500	p. r.	128 61
Union	57	1	500	p. r.	42 87
Aptos	73	1	500	p. r.	42 87
Roache	91	1	500	p. r.	42 87
Vine Hill	29	1	500		42 87
Aqua Puerca	16	1	500		42 87
Hill	16	1	500		42 87
Casserly	51	1	500	p. r.	42 87
San Vicente	29	1	500		42 87
Live Oak	50	1	500	p. r.	42 87
Boulder Creek	44	1	500		42 87

Davenport	15	1	500		42 87
[Joint Dist. with Summit, Santa Clara.]					
Summit	35	3-5ths	312	50	25 72
	3,008	45 3/5	22.812	50	1,954 87

SHASTA.

Number of census children, 1,473. State apportionment, August 1, 1874, $957 45. Minimum amount of school fund needed for 1874-5, $14.000. Amount of State school fund for 1873-4, $4,006 35. Amount to be raised from county school tax, $10,394. Probable amount of State school fund for 1874-5, $11,047 50. Amount to be raised from county school tax, $4,419.

American Ranch	22	1	500		34 19
Bald Hill	45	1	500		34 19
Buckeye	40	1	500		34 19
Burney Valley	41	1	500		34 10
Cañon House	101	1	500	p. r.	34 19
Centreville	62	1	500	p. r.	34 19
Clover Creek	63	1	500	p. r.	34 19
Cottonwood	37	1	500		34 19
Cow Creek	60	1	500	p. r.	34 19
Eagle Creek	52	1	500	p. r.	34 19
Fall River	57	1	500	p. r.	34 19
French Gulch	71	1	500	p. r.	34 19
Klotz's Mill	58	1	500	p. r.	34 19
Millville	116	2	1000	p. r.	68 38
Oak Knoll	27	1	500		34 19
Parkville	47	1	500		34 19
Piety Hill	50	1	500	p. r.	34 19
Pitt River	62	1	500	p. r.	34 19
Round Mountain	59	1	500	p. r.	34 19
Sacramento River	37	1	500		34 19
Shasta	226	3	1500	p. r.	102 57
Sheldon	19	1	500		34 19
Sierra	43	1	500		34 19
Stillwater	40	1	500		34 19
Whisky Creek	38	1	500		34 19
	1,473	28	14,000		957 32

SIERRA.

Number of census children, 1,091. State apportionment, August 1, 1874, $709 15. Minimum amount of school fund needed for 1874-5, $11,527 08. Amount of State school fund for 1873-4, $3,012 78. Amount to be raised from county school tax, $8,816. Probable amount of State school fund for 1874-5, $8,182 50. Amount to be raised from county school tax, $4,163.

Alleghany	62	1	500	p. r.	30 83
Alpine	26	1	500		30 83
Alta	23	1	500		30 83
Butte	52	1	500	p. r.	30 83
Downieville	190	2	1000	p. r.	61 66
Eureka	36	1	500		30 83
Forest	68	1	500	p. r.	30 83
Gibsonville	33	1	500		30 83
Goodyear	48	1	500		30 83

Loyalton	76	1	500	p. r.	30 83
Minnesota	16	1	500		30 83
Morristown	10	3-5ths	300		18 50
Mount Pleasant	30	1	500		30 83
Newark	30	1	500		30 83
Plum Valley	33	1	500		30 83
Poker Flat	19	1	500		30 83
Sierraville	102	1	500	p. r.	30 83
St. Louis	38	1	500		30 83
Table Rock	54	1	500	p. r.	30 83
Union	57	1	500	p. r.	30 83
Washington	26	1	500		30 83
[Joint Dist. with Antelope, Plumas Co.]					
Antelope	21	3-5ths	300		18 50
[Joint Dist. with Rocky Point, Plumas.]					
Rocky Point	41	4-5ths	427 08		24 66
	1,091	23	11,527 08		709 09

SOLANO.

Number of census children, 4,430. State apportionment, August 1, 1874, $2,879 50. Minimum amount of school fund needed for 1874–5, $32,772 30. Amount of State school fund for 1873–4, $11,384 64. Amount to be raised from county school tax, $22,526 12. Probable amount of State school fund for 1874–5, $33,225. Amount to be raised from county school tax, $13,290.

Alamo	48	1	500		43 89
American Cañon	32	1	500		43 89
Benicia	481	5	2500	p. r.	219 45
Binghamton	67	1	500	p. r.	43 89
Bunker Hill	97	1	500	p. r.	43 89
Crystal	249	3	1500	p. r.	131 67
Center	57	1	500	p. r.	43 89
Collinsville	25	1	500		43 89
Dover	28	1	500		43 89
Denverton	16	1	500		43 89
Dixon	182	2	1000	p. r.	87 78
Egbert	42	1	500		43 89
Esmeralda	26	1	500		43 89
Enterprise	13	3-5ths	300		26 33
Fairfield	105	1	500	p. r.	43 89
Grant	73	1	500	p. r.	43 89
Green Valley	71	1	500	p. r.	43 89
Gomer	24	1	500		43 89
King	38	1	500		43 89
Maine Prairie	41	1	500		43 89
Montezuma	33	1	500		43 89
Oak Dale	36	1	500		43 89
Owens	42	1	500		43 89
Pitts	67	1	500	p. r.	43 89
Pleasant Valley	32	1	500		43 86
Peaceful Glen	20	1	500		43 89
Rio Vista	135	2	1000	p. r	87 78
Rockville	56	1	500	p. r.	43 89
Round Hill	45	1	500		43 89
Salem	32	1	500		43 89
Silveyville	106	1	500	p. r.	43 89
Solano	57	1	500	p. r.	43 89

Suisun	60	1	500	p. r.	43 89
Fremont	56	1	500	p. r.	43 89
Ulatus	148	2	1000	p. r.	87 78
Union	69	1	500	p. r.	43 89
Vallejo	1578	16	8000	p. r.	702 24
Wolfskill	30	1	500		43 89
Canright	26	1	500		43 89
Peña	27	1	500		43 89
Morning Light	22	1	500		43 89
[Joint Dist. with Mountain, Napa Co.]					
Mountain	21	4-5ths	350		35 12
[Joint Dist. with Yolo, Yolo Co.]					
Putah	17	1-5th	122	30	8 77
	4,430	65 3/5	32,772	30	2,879 18

STANISLAUS.

Number of census children, 1,835. State apportionment, August 1, 1874, $1,192 75. Minimum amount of school fund needed for 1874–5, $20,353 83. Amount of State school fund for 1873–4, $5,054 32. Amount to be raised from county school tax, $15,805. Probable amount of State school fund for 1874–5, $13,762 50. Amount to be raised from county school tax, $7,968.

Adamsville	65	1	500	p. r.	28 95
Bachelor Valley	50	1	500	p. r.	28 95
Belpassi	50	1	500	p. r.	28 95
Booth	22	1	500		28 95
Bonita	42	1	500		28 95
Branch	106	1	500	p. r.	28 95
Burnett	17	1	500		28 95
Buena Vista	41	1	500		28 95
Cole	32	1	500		28 95
Dry Creek	12	3-5ths	300		17 37
Davis	57	1	500	p. r.	28 95
Empire	23	1	500		28 95
Emery	79	1	500	p. r.	28 95
Farm Cottage	32	1	500		28 95
Fair View	62	1	500	p. r.	28 95
Grant	36	1	500		28 95
Garner	31	1	500		28 95
Grayson	39	1	500		28 95
Haight	34	1	500		28 95
Hill's Ferry	35	1	500		28 95
Horr's Ranch	18	1	500		28 95
Jackson	54	1	500	p. r.	28 95
Jefferson	38	1	500		28 95
Jones	58	1	500	p. r.	28 95
Junction	51	1	500	p. r.	28 95
Marksville	20	1	500		28 95
McHenry	33	1	500		28 95
Modesto	236	3	1500	p. r.	86 85
Oak Dale	65	1	500	p. r.	28 95
Orestimba	50	1	500	p. r.	28 95
Paradise	25	1	500		28 95
Union	18	1	500		28 95
Rhinehart	29	1	500		28 95
Rowe	35	1	500		28 95
Tuolumne	45	1	500		28 95

Washington	55	1	500	p. r.	28 95
White Crow	25	1	500		28 95
White Oak	41	1	500		28 95
[Joint Dist. with Black Hills, Calaveras.]					
Black Hills	26	3-5ths	275	60	17 37
[Joint Dist. with Home, San Joaquin.]					
Home Union	16	2-5ths	205	13	11 58
[Joint Dist. with Rising Sun, S. Joaquin.]					
Rising Sun	32	3-5ths	348	70	17 37
	1,835	$41\frac{1}{5}$	20.353	83	1,192 74

SUTTER.

Number of census children, 1,478. State apportionment, August 1, 1874, $960 70. Minimum amount of school fund needed for 1874-5, $18,837 83. Amount of State school fund for 1873-4, $3,853 36. Amount to be raised from county school tax, $15,370. Probable amount of State school fund for 1874-5, $11,095. Amount to be raised from county school tax, $8,852.

Auburn	47	1	500		25 50
Barry	42	1	500		25 50
Bear River	26	1	500		25 50
Browns	58	1	500	p. r.	25 50
Brittans	41	1	500		25 50
Buttesylvania	22	1	500		25 50
Central	60	1	500	p. r.	25 50
Columbia	58	1	500	p. r.	25 50
Eagle	37	1	500		25 50
Franklin	21	1	500		25 50
Gaither	55	1	500	p. r.	25 50
Grant	44	1	500		25 50
Illinois	31	1	500		25 50
Knights	33	1	500		25 50
Jefferson	30	1	500		25 50
Lee	23	1	500		25 50
Lincoln	45	1	500		25 50
Live Oak	28	1	500		25 50
Marcum	35	1	500		25 50
Meridian	57	1	500	p. r.	25 50
Myres	28	1	500		25 50
Nicolaus	60	1	500	p. r.	25 50
North Butte	38	1	500		25 50
Noyes	23	1	500		25 50
Prairie	16	1	500		25 50
Rome	36	1	500		25 50
Salem	18	1	500		25 50
Slough	42	1	500		25 50
Sutter	32	1	500		25 50
Union	23	1	500		25 50
Vernon	27	1	500		25 50
Washington	45	1	500		25 50
West Butte	36	1	500		25 50
Winship	39	1	500		25 50
Willow Pond	35	1	500		25 50
Yuba	160	2	1000	p. r.	51 10
[Joint Dist. with Fair View, Placer Co.]					
Fair View	25	3-5ths	337	83	15 33
	1,478	$37\frac{3}{5}$	18,837	83	960 68

TEHAMA.

Number of census children, 1,381. State apportionment, August 1, 1874, $897 65. Minimum amount of school fund needed for 1874-5, $13,500. Amount of State school fund for 1873-4, $3,603 98. Amount to be raised from county school tax, $10,257. Probable amount of State school fund for 1874-5, $10,357 50. Amount to be raised from county school tax, $4,178.

Red Bluff	434	5	2500	p. r.	166 20
Tehama	142	2	1000	p. r.	66 48
Coast Range	30	1	500		33 24
Paskenta	35	1	500		33 24
Lassen	54	1	500	p. r.	33 24
Antelope	71	1	500	p. r.	33 24
Cottonwood	45	1	500		33 24
Sierra	84	1	500	p. r.	33 24
Stony Creek	29	1	500		33 24
Oat Creek	21	1	500		33 24
Montgomery	23	1	500		33 24
Orion	43	1	500		33 24
Toomes	22	1	500		33 24
Hunters	48	1	500		33 24
Washington	46	1	500		33 24
Elder Creek	15	1	500		33 24
Reed's Creek	37	1	500		33 24
Red Bank	64	1	500	p. r.	33 24
Elkins	39	1	500		33 24
Moons	18	1	500		33 24
Live Oak	26	1	500		33 24
Lowery	22	1	500		33 24
	1,381	27	13,500		897 48

TRINITY.

Number of census children, 596. State apportionment, August 1, 1874, $387 40. Minimum amount of school fund needed for 1874-5, $5,300. Amount of State school fund for 1873-4, $1,598 46. Amount to be raised from county school tax, $3,861. Probable amount of State school fund for 1874-5, $4,470. Amount to be raised from county school tax, $1,788.

Weaverville	194	2	100	p. r.	73 08
Hay Fork	87	1	500	p. r.	36 54
Lewiston	69	1	500	p. r.	36 54
Douglas City	65	1	500	p. r.	36 54
Junction City	59	1	500	p. r.	36 54
North Fork	51	1	500	p. r.	36 54
Trinity Center	22	1	500		36 54
Cox's Bar	26	1	500		36 54
Hyampom	16	1	500		36 54
Cañon Creek	13	3-5ths	300		21 92
	596	$10\frac{3}{5}$	5,300		387 32

TULARE.

Number of census children, 2,177. State apportionment, August 1, 1874, $1,415 05. Minimum amount of school fund needed for 1874-5, $18,000. Amount of State school fund for 1873-4, $5,146 21. Amount to be raised from

county school tax, $13,368. Probable amount of State school fund for 1874-5, $16,327 50. Amount to be raised from county school tax, $6,531.

Cottonwood	53	1	500	p. r.	39 30
Deep Creek	74	1	500	p. r.	39 30
Elbow	38	1	500		39 30
Elbow Creek	89	1	500	p. r.	39 30
Fitzgerald	176	2	1000	p. r.	78 60
Farmersville	43	1	500		39 30
Kaweah	29	1	500		39 30
King's River	88	1	500	p. r.	39 30
Outside Creek	33	1	500		39 30
Oak Grove	50	1	500	p. r.	39 30
Packwood	27	1	500		39 30
Rockeford	49	1	500		39 30
Tule River	87	1	500	p. r.	39 30
Union	61	1	500	p. r.	39 30
Visalia	395	4	2000	p. r.	157 20
Vandalia	79	1	500	p. r.	39 30
Willow	38	1	500		39 30
Harmony	46	1	500		39 30
Mountain View	68	1	500	p. r.	39 30
Pioneer	43	1	500		39 30
Plain	22	1	500		39 30
Antelope	68	1	500	p. r.	39 30
Pleasant Grove	75	1	500	p. r.	39 30
Sand Creek	44	1	500		39 30
Elder	27	1	500		39 30
Tokohl	63	1	500	p. r.	39 30
Lake	124	2	1000	p. r.	78 60
Burton	43	1	500		39 30
Cove	45	1	500		39 30
South Tule	41	1	500		39 30
Mussel Slough	59	1	500	p. r.	39 30
	2,177	36	18,000		1,414 80

TUOLUMNE.

Number of census children, 1,945. State apportionment, August 1, 1874, $1,264 25. Minimum amount of school fund needed for 1874-5, $16,000. Amount of State school fund for 1873-4, $5,568 46 Amount to be raised from county school tax, $10,988. Probable amount of State school fund for 1874-5, $14,587 50. Amount to be raised from county school tax, $5,835.

Sonora	484	5	2500	p. r.	197 50
Columbia	318	4	2000	p. r.	158 00
Jamestown	136	2	1000	p. r.	79 00
Big Oak Flat	136	2	1000	p. r.	79 00
Tuttletown	118	2	1000	p. r.	79 00
Poverty Hill	86	1	500	p. r.	39 50
Chinese Camp	74	1	500	p. r.	39 50
Shaw's Flat	61	1	500	p. r.	39 50
Moccasin Creek	52	1	500	p. r.	39 50
Green Springs	51	1	500	p. r	39 50
Curtis' Creek	49	1	500		39 50
Montezuma	49	1	500		39 50
Springfield	46	1	500		39 50
Soulsbyville	44	1	500		39 50

Summersville	44	1	500		39 50
Confidence	43	1	500		39 50
Blanket Creek	33	1	500		39 50
Willow Springs	30	1	500		39 50
Sullivan's Creek	26	1	500		39 50
Don Pedro's Bar	24	1	500		39 50
Corner	24	1	500		39 50
Phoenix	17	1	500		39 50
	1,945	32	16,000		1,264 00

VENTURA.

Number of census children, 1,026. State apportionment August 1, 1874, $666 90. Minimum amount of school fund needed for 1874-5, $8,000. Amount of State school fund for 1873-4, $2,763 55. Amount to be raised from county school tax, $5,513. Probable amount of State school fund for 1874-5, $7,695. Amount to be raised from county school tax, $3,078.

San Buena Ventura	428	5	2500	p. r.	208 40
Sespe	72	1	500	p. r.	41 68
West Sespe	52	1	500	p. r.	41 68
Live Oak	15	1	500		41 68
Ocean	48	1	500		41 68
Saticoy	55	1	500	p. r.	41 68
Pleasant Valley	79	1	500	p. r.	41 68
Santa Clara	49	1	500		41 68
Brigg's	23	1	500		41 68
San Pedro	79	1	500	p. r.	41 68
Huenema	76	1	500	p. r.	41 68
Ojai	50	1	500	p. r.	41 68
	1,026	16	8,000		666 88

YOLO.

Number of census children, 2,404. State apportionment, August 1, 1874, $1,562 60. Minimum amount of school fund needed for 1874-5, $23,477 70. Amount of State school fund for 1873-4, $6,448 19. Amount to be raised from county school tax, $17,674. Probable amount of State school fund for 1874-5, $18,030. Amount to be raised from county school tax, $7,212.

Prairie	49	1	500		33 24
Gordon	70	1	500	p. r.	33 24
Eureka	68	1	500	p. r.	33 24
Washington	185	2	1000	p. r.	66 48
Grand Island	11	3-5ths	300		19 94
Cache Creek	31	1	500		33 24
Montgomery	18	1	500		33 24
Willow Slough	28	1	500		33 24
Fairview	44	1	500		33 24
Pleasant Prairie	35	1	500		33 24
Center	55	1	500	p. r.	33 24
Spring Lake	22	1	500		33 24
Lisbon	51	1	500	p. r.	33 24
Grafton	152	2	1000	p. r.	66 48
Buckeye	50	1	500	p. r.	33 24
Fillmore	34	1	500		33 24
Monitor	33	1	500		33 24

Clover	34	1	500		33 24
Mount Pleasant	29	1	500		33 24
Sacramento River	30	1	500		33 24
Woodland Prairie	23	1	500		33 24
Buchanan	31	1	500		33 24
Woodland	516	6	3000	p. r.	199 44
Vernon	25	1	500		33 24
Union	50	1	500	p. r.	33 24
Putah	31	1	500		33 24
Cañon	49	1	500		33 24
Merritt	50	1	500	p. r.	33 24
Plainfield	74	1	500	p. r.	33 24
Cottonwood	65	1	500	p. r.	33 24
Capay	50	1	500	p. r.	33 24
Pine Grove	30	1	500		33 24
North Grafton	46	1	500		33 24
Monument	26	1	500		33 24
Liberty	43	1	500		33 24
Franklin	20	1	500		33 24
Cacheville	78	1	500	p. r.	33 24
Fairfield	32	1	500		33 24
Enterprise	14	3-5ths	300		19 94
[Joint Dist. with Putah, Solano Co.]					
Yolo	122	1 4-5	877 70		59 84
	2,404	47	23,477 70		1,562 28

YUBA.

Number of census children, 2,601. State apportionment, August 1, 1874, $1,690 65. Minimum amount of school fund needed for 1874-5, $22,113. Amount of State school fund for 1873-4, $7,296 39. Amount to be raised from county school tax, $15,546. Probable amount of State school fund for 1874-5, $19,507 50. Amount to be raised from county school tax, $7,803.

Bear River	127	2	1000	p. r.	76 50
Brophy's	42	1	500		38 25
Brown's Valley	42	1	500		38 25
Buckeye	35	1	500		38 25
Clark	23	1	500		38 25
Cordua	29	1	500		38 25
Dobbin's Ranch	36	1	500		38 25
Elizabeth	40	1	500		38 25
Greenville	37	1	500		38 25
Hausonville	22	1	500		38 25
Honcut	31	1	500		38 25
Indian Ranch	47	1	500		38 25
Junction	22	1	500		38 25
Linda	60	1	500	p. r.	38 25
Long Bar	24	1	500		38 25
Lone Tree	41	1	500		38 25
Marysville	1065	11	5500	p. r.	420 75
McDonalds	21	1	500		38 25
New York	57	1	500	p. r.	38 25
Oak Valley	39	1	500		38 25
Oregon House	46	1	500		38 25
Peoria	39	1	500		38 25
Plumas	61	1	500	p. r.	38 25
Prairie House	30	1	500		38 25
Rose's Bar	214	2	1000	p. r.	76 50

Sharon Valley	63	1	500	p. r.	38 25
Slate Range	130	2	1000	p. r.	76 50
Spring Valley	44	1	500		38 25
Strawberry Valley	32	1	500		38 25
Virginia	51	1	500	p. r.	38 25
Yuba	44	1	500		38 25
[Joint Dist. with Clipper Mills, Butte.]					
Woodville	7	1-5th	113		7 65
	2,601	44 1/5	22,113		1,690 65

*HUMBOLDT.

Number of census children, 2,402. State apportionment, August 1, 1874, $1,561 30. Minimum amount of school fund needed for 1874–5, $21,000. Amount of State school fund for 1873–4, $6,181 55. Amount to be raised from county school tax, $15,437. Probable amount of State school fund for 1874–5, $18,015. Amount to be raised from county school tax, $7,206.

Mad River	71	1	500	p. r.	37 17
Janes	62	1	500	p. r.	37 17
Bay	38	1	500		37 17
Union	234	3	1500	p. r.	111 51
Eureka	506	5	2500	p. r.	185 85
Peninsula	27	1	500		37 17
Elk River	54	1	500	p. r.	37 17
Bucksport	50	1	500	p. r.	37 17
Salmon Creek	46	1	500		37 17
Table Bluff	69	1	500	p. r.	37 17
Pacific	30	1	500		37 17
Slide	60	1	500	p. r.	37 17
Rohnerville	142	2	1000	p. r.	74 34
Hydesville	122	2	1000	p. r.	74 34
Yager Creek	34	1	500		37 17
Laribee	48	1	500		37 17
South Fork	127	2	1000	p. r.	74 34
McDiarmid's Prairie	19	1	500		37 17
Van Duzen	33	1	500		37 17
Grizzly Bluff	71	1	500	p. r.	37 17
Island	41	1	500		37 17
Grant	41	1	500		37 17
Ferndale	121	2	1000	p. r.	74 34
Centerville	40	1	500		37 17
Bear River	36	1	500		37 17
Mattole	118	2	1000	p. r.	74 34
Upper Mattole	71	1	500	p. r.	37 17
Cuddeback	18	1	500		37 17
Eagle Prairie	25	1	500		37 17
Worthington's Prairie	22	1	500		37 17
Fresh Water	26	1	500		37 17
	2,402	42	21,000		1,561 14

*LOS ANGELES.

Number of census children, 7,124. State apportionment, August 1, 1874, $4,630 60. Minimum amount of school fund needed for 1874–5, $45,000. Amount of State School fund for 1873–4, $18,667 09. Amount to be raised from

*Received too late for classification.

county school tax, $38,200. Probable amount of State school fund for 1874–5, $53,430. Amount to be raised from county school tax, $21,372.

Alameda	118	2	1000	p. r.	102 90
Anaheim	255	3	1500	p. r.	154 35
Azusa	145	2	1000	p. r.	102 90
Bollona	179	2	1000	p. r.	102 90
Bolsa Grande	40	1	500		51 45
Bog Dale	70	1	500	p. r.	51 45
Cahuenga	70	1	500	p. r.	51 45
Cienega	131	2	1000	p. r.	102 90
Duarte	65	1	500	p. r.	51 45
El Monte	145	2	1000	p. r.	102 90
Elizabeth Lake	50	1	500	p r.	51 45
Fair View	51	1	500	p. r.	51 45
Florence	40	1	500		51 45
Green Meadows	93	1	500	p. r.	51 45
La Puenta	104	1	500	p. r.	51 45
La Dow	92	1	500	p. r.	51 45
Los Angeles	2411	24	12000	p. r.	1,234 80
Little Lake	41	1	500		51 45
Los Nietos	146	2	1000	p. r.	102 90
Maizeland	72	1	500	p. r.	51 45
New River	80	1	500	p. r.	51 45
New Port	97	1	500	p. r.	51 45
Old Mission	145	2	1000	p. r.	102 90
Orangethorpe	30	1	500		51 45
Palomares	224	3	1500	p. r.	154 35
Richland	145	2	1000	p. r.	102 90
Ranchito	79	1	500	p. r.	51 45
Rowland	117	2	1000	p. r.	102 90
Santa Ana	216	3	1500	p. r.	154 35
San Antonio	95	1	500	p. r.	51 45
San Fernando	149	2	1000	p. r.	102 90
San Gabriel	241	3	1500	p. r.	154 35
San Juan	171	2	1000	p. r.	102 90
San José	117	2	1000	p. r.	102 90
San Pedro	176	2	1000	p. r.	102 90
Silver	147	2	1000	p. r.	102 90
Soledad	50	1	500	p. r.	51 45
Spring	101	1	500	p. r.	51 45
Sycamore	37	1	500		51 45
Vernon	119	2	1000	p. r.	102 90
Westminster	61	1	500	p. r.	51 45
Wilmington	157	2	1000	p. r.	102 90
San Dimas	52	1	500	p. r.	51 45
	7,124	90	45,000		4,630 50

MODOC.

Number of census children, 968. State Apportionment, August 1, 1874, $629 20. Probable amount of State school fund for 1874–5, $7,260.

Centerville	107	107	1	107 00	46 01
Adin	86	.. ..	.....	.....	44 38
Lake City	80	166	1.2	199 20	41 28
Deep Creek	78	78	1.3	101 40	43 60
Cedarville	52	.....	.....	.....	33 54

Eagleville	50	102	1.5	153 00	32 25
Goose Lake	48	.....	.....	.....	33 02
Nevada	49	.....	.....	.....	33 71
Oregon	49	.....	.....	.....	33 71
Round Valley	48	194	1.6	310 40	33 02
Arlington	36	.....	.....	.....	26 32
Big Valley	32	.....	.....	.....	23 39
Dorrisville	36	.....	.....	.....	26 32
Mt. Bidwell	30	.....	.....	.....	21 93
Surprise Valley	32	166	1.7	282 20	23 39
Ash Creek	20	.....	.....	.....	15 48
Doten	20	.....	.....	.....	15 48
Lassen	24	.....	.....	.....	18 58
Pitt River	28	.....	.....	.....	21 67
Stone Coal	22	114	1.8	205 20	17 03
Overton	18	.....	.....	.....	15 48
Riceland	18	.....	.....	.....	15 48
Fall River	5	41	2.0	82 00	4 30
	968	968	.....	1,440 40	619 37

SISKIYOU.

Number of census children, 1,597. State apportionment, August 1, 1874, $1,038 05. Probable amount of State school fund for 1874-5, $11,977 50.

Scott Valley	115	.....	.....	.....	51 75
Yreka	436	551	1.0	551 00	196 20
Little Shasta	80	80	1.2	96 00	43 20
Etna	67	.....	.....	.....	42 21
Washington	64	131	1.4	183 40	40 32
Scott River	51	.....	.....	.....	34 42
Willow Creek	51	102	1.5	153 00	34 42
Butteville	41	.....	.....	.....	29 52
Douglass	44	.....	.....	.....	31 68
Lincoln	48	.....	.....	.....	34 56
Table Rock	46	179	1.6	286 40	33 12
Callahans	35	.....	.....	.....	26 77
Cedar Park	35	.....	.....	.....	26 77
Cottonwood	39	.....	.....	.....	29 83
Franklin	34	.....	.....	.....	26 01
Hawkinsville	34	.....	.....	.....	26 01
Oro Fino	38	.....	.....	.....	29 07
Meamber	37	.....	.....	.....	28 30
Bogus	30	282	1.7	479 40	22 95
Hooper	28	.....	.....	.....	22 68
Mount Shasta	21	.....	.....	.....	17 01
Quartz Valley	23	.....	.....	.....	18 63
South Fork	24	.....	.....	.....	19 44
Vineland	24	120	1.8	216 00	19 44
Berryvale	19	.....	.....	.....	17 10
East Fork	19	.....	.....	.....	17 10
Hamburg Bar	16	.....	.....	.....	14 40
Humbug	14	.....	.....	.....	12 60
Klamath	18	.....	.....	.....	16 20
Moffit Creek	18	.....	.....	.....	16 20
Shasta Valley	15	.....	.....	.....	13 50
Siad Valley	16	.....	.....	.....	14 40
Union	17	152	2.0	304 00	15 30
	1,597	1,597	.....	2,269 20	1,021 11

SONOMA.

Number of census children, 6,526. State apportionment, August 1, 1874, $4,241 90. Probable amount of State school fund for 1874–5, $48,945.

Bloomfield	114	.....	.....	.....	57 00
Cloverdale	224	.....	.....	.....	112 00
Court House	691	.....	.....	.....	345 50
Healdsburg	401	.....	.....	.....	200 50
Laguna	102	.....	.....	.....	51 00
Miriam	160	.....	.....	.....	80 00
Petaluma	872	.....	.....	.....	436 00
Potter	117	.....	.....	.....	58 50
Sonoma	283	.....	.....	.....	141 50
Windsor	103	3067	1.0	3067 00	51 50
Payran	98	.....	.....	.....	53 90
Redwood	98	196	1.1	215 60	53 90
Walala	88	88	1.2	105 60	52 80
Geyserville	70	.....	.....	.....	45 50
Harvey	75	.....	.....	.....	48 75
Scotta	74	.....	.....	.....	48 10
Wilson	72	291	1.3	378 30	46 80
Freestone	68	.....	.....	.....	47 60
Hamilton	62	.....	.....	.....	43 40
Mark West	66	.....	.....	.....	46 20
Mendocino	65	.....	.....	.....	45 50
Oak Grove	63	.....	.....	.....	44 10
Stewart's Point	67	391	1.4	547 40	46 90
Bodega	51	.....	.....	.....	38 25
Cinnabar	56	.....	.....	.....	42 00
Dunbar	54	.....	.....	.....	40 50
Green Valley	53	.....	.....	.....	39 75
Gilford	59	.....	.....	.....	44 25
Hall	51	.....	.....	.....	38 25
Hill	58	.....	.....	.....	43 50
Mill Creek	53	.....	.....	.....	39 75
Oriental	50	.....	.....	.....	37 50
Piner	53	.....	.....	.....	39 75
San Antonio	59	.....	.....	.....	44 25
Sotoyome	59	.....	.....	.....	44 25
Tarwater	56	712	1.5	1068 00	42 00
Burnside	46	.....	.....	.....	36 80
Coleman Valley	45	.....	.....	.....	36 00
Dunham	46	.....	.....	.....	36 80
Enterprise	41	.....	.....	.....	32 80
Fisk's Mill	47	.....	.....	.....	37 60
Iowa	42	.....	.....	.....	33 60
Knight's Valley	43	.....	.....	.....	34 40
La Fayette	47	.....	.....	.....	37 60
Lakeville	46	.....	.....	.....	36 80
Lewis	47	.....	.....	.....	37 60
Liberty	49	.....	.....	.....	39 20
Manzanita	43	.....	.....	.....	34 40
Marin	42	.....	.....	.....	33 60
Occidental	44	.....	.....	.....	35 20
Spring Hill	43	.....	.....	.....	34 40
Strawberry	43	.....	.....	.....	34 40
Washington	41	755	1.6	1208 00	32 80
Alexander	37	.....	.....	.....	31 45
Alpine	35	.....	.....	.....	29 75

Copeland	35	.....	.....	.....	29 75
Dry Creek	37	.....	.....	.....	31 45
Grape	39	.....	.....	.....	33 15
Independence	39	.....	.....	.....	33 15
Junction	31	.....	.....	.....	26 35
Lone Redwood	31	.....	.....	.....	26 35
Rincon	30	.....	.....	.....	25 50
Starr	37	.....	.....	.....	31 45
Steuben	39	.....	.....	.....	33 15
Todd	38	.....	.....	.....	32 30
Walker	34	.....	.....	.....	28 90
Watmaugh	33	.....	.....	.....	28 05
Waugh	37	532	1.7	904 40	31 45
American Valley	26	.....	.....	.....	23 40
Burns	28	.....	.....	.....	25 20
Hearn	20	.....	.....	.....	18 00
Lake	25	.....	.....	.....	22 50
Laurel Grove	25	.....	.....	.....	22 50
Mayaccama	28	.....	.....	.....	25 20
Monroe	25	.....	.....	.....	22 50
Mount Vernon	27	.....	.....	.....	24 30
Pleasant Hill	20	.....	.....	.....	18 00
Russian River	29	.....	.....	.....	26 10
Santa Rosa	28	.....	.....	.....	25 20
Stony Point	21	.....	.....	.....	18 90
Table Mountain	21	.....	.....	.....	18 90
Wallace	29	.....	.....	.....	26 10
Watson	27	.....	.....	.....	24 30
Wright	29	408	1.8	734 40	26 10
Canfield	15	.....	.....	.....	15 00
Eagle	19	.....	.....	.....	19 00
Guillicos	17	.....	.....	.....	17 00
Mountain	19	.....	.....	.....	19 00
Pacific	16	86	2.0	172 00	16 00
	6,526	6,526	.....	8,400 70	4,200 35

AGASSIZ ON EDUCATION.

THE idea that poor teachers can give elementary instruction, that in the beginning, when children are young, the character of the instruction is less important, is a fatal mistake. The best teachers should initiate the studies, and guide the early development of children.

Not by a superficial familiarity with many things, but by a thorough knowledge of a few things, does any one grow in mental strength and vigor. De Candolle told me that he could teach all he knew with a dozen plants. Unquestionably he could have done it better perhaps with so few than with many, certainly for beginners. If a teacher does not require many specimens, so they be well selected, neither should he

seek for them far and wide. Let the pupil find in his daily walks the illustrations and repeated evidence of what he has heard in the school-room. I think there should be a little museum in every school-room, some dozen specimens of radiates, a few hundred shells, a hundred insects, with some crustacea and worms, a few fishes, birds and mammalia, enough to characterize every class in the animal kingdom. Pupils should be encouraged to find their own specimens, and taught to handle them. This training is of greater value and wider application than it may seem. Delicacy of manipulation, such as the higher kinds of investigation demand, requires the whole organization to be brought into harmony with the mental action. The whole nervous system must be in subordination to the intellectual purpose. Even the pulsation of the arteries must not disturb the steadiness of attitude and gaze of the investigation.

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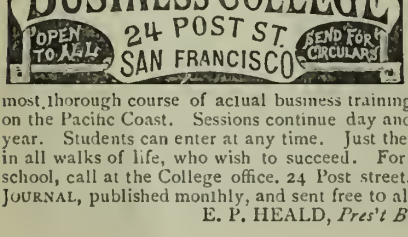

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THE

CALIFORNIA TEACHER.

SEPTEMBER, 1874.

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MANUAL OF INSTRUCTIONS REGARDING THE COURSE OF STUDIES.

At the meeting of the State Board of Education, held Feb. 17, 1873, a Revised Course of Studies was adopted in accordance with the provisions of subdivision four of section one thousand five hundred and twenty-one of the Political Code. Subdivision 5 of section 1543, makes it obligatory upon County Superintendents to enforce the course of studies. Subdivision 10 of section 1617, requires Trustees to enforce the course of studies. According to subdivision 3 of section 1696, every teacher in the public schools must enforce the course of studies. The salary of any teacher failing to do so must be withheld, under the provisions of section 1700, otherwise the officer drawing such warrant can be held responsible on his official bond for every dollar so paid out. The Revised Course of Studies was required to be enforced on and after January 1st, 1874. The Course was published in the CALIFORNIA TEACHER for April, 1873; again published in the School Law printed in 1873; again published in the Fifth Biennial Report of the Superintendent of Public Instruction; and again published in the School Law printed August, 1874. We are particular about stating the pamphlets and books in which the Course may be found, as quite a number of teachers and school officers do not seem to know that the Course has ever been published.

At the same meeting of the State Board of Education, Feb. 17, 1873, the Committee on the Revision of the Course of Studies was instructed to prepare a *Manual* to accompany the Course. This *Manual* was to be printed in pamphlet form as soon as prepared. Unforseen difficulties have, however, delayed its publication, until we are compelled, in order to place the *Manual* at all before the teachers, to publish it through the TEACHER. This mode of publication will necessitate a curtailment of many details which might be of interest and value to teachers. It will necessitate also the republishing of some matter which has already appeared in the TEACHER and the Fifth Biennial Report. In the TEACHER for May, 1873, page 388, we published some remarks concerning the necessity and feasibility of a Graded Course of Instruction for so-called ungraded schools. Instructions regarding the grading and classifying of schools were published in the TEACHER for August, 1873, page 49. The manner of preparing a Programme for Teaching the Course of Studies received attention in the TEACHER for September, 1873, page 74, and October, 1873, page 118. An article on "Teaching Reading" was published in the TEACHER for September, 1873, page 78, and an article on "Teaching Spelling" was published October, 1873, page 121. The article on Arithmetic, occupying the whole of the January, 1873, number, is the basis of the instruction in this branch for the primary classes. A part of this article was republished in the Fifth Biennial Report, to which was added a synopsis of the work required for the second and third divisions of the Third Grade.

The *Manual* is designed to give instructions in regard to the methods of teaching, grading and classifying. The Course of Studies determines the teacher's work; the *Manual* offers aids for its accomplishment. The instructions given in the Manual are not to be considered as precepts, except when so specified; but they are to be considered as hints to good methods that may serve such teachers as have not found better methods.

The Manual will be divided into two parts, the first of which will give general suggestions suitable for all grades; the second, specific directions for the several divisions. The line of demarcation, and the sequence of the parts can, however, not be as strict and distinct as here indicated, and as would be possible

were the Manual published in a pamphlet form. Thus the grading and classifying of schools belongs to the first part; but as any directions and suggestions on this subject would be in part meaningless until the details of the work required for the several divisions are explained and illustrated, the consideration of this subject must be deferred to the last. So with Recitations, Programmes, etc.

PART 1. GENERAL SUGGESTIONS.

§ 1. USE OF TEXT-BOOKS.

The chief value of a text-book consists in the clear and precise statement of the aims and requirements in respect to the subject of instruction which it is presumed to present. The text-book should, first, distinctly indicate what is to be accomplished; secondly, indicate to the teacher the right way of handling the subjects of instruction. The text-book should, therefore, furnish the pupil with suitable topics, properly arranged, and clothed in appropriate language, and furnish the teacher with "new methods of illustration, and new paths through which the pupil may be led to the direct comprehension of the facts learned, to the fullest apprehension of their value, and to the best understanding of their relations to other facts previously learned."

Unfortunately, book-makers and publishers have seen fit to lumber text-books with a great mass of useless details, in some instances completely smothering if not excluding what alone is of real importance to the pupil. The first care of a teacher must, therefore, be, not to teach the contents of a text-book the best way he can, but to winnow the chaff from the wheat. To do this his knowledge of the subject must be full and comprehensive, and far more so than can ever be required of pupils. This will give him such a familiarity with the topics to be studied by the pupils, that the text-book is to him a book of reference only, to which he is never confined, either in instructing or during recitation. Hence in recitations, the text-book must be laid aside by the teacher, except in the case of reading, grammatical analysis, and spelling. In every other exercise the text-book will be a hindrance rather than a help.

The teacher will now be prepared to assign lessons and recitations of the proper kind and length; and the pupils will soon

find that the teacher's work is to "*teach and work with them*," instead of the automatic work of merely giving out lessons which are gauged by the number of paragraphs or pages the pupil is assumed to be able to ponder over in a definite time, and of hearing recitations which are too frequently determined by the questions at the end of the lesson, or the bottom of the page. During recitations, the pupil's desk is the proper place for the pupil's text-book. In all recitations, except as stated above, text-books should be laid aside by teacher and pupil alike. We offer the following, taken from the *Chicago Course of Instruction*, as additional suggestions, which will be of value to teachers:

"Before the recitation, the teacher will have arranged the divisions of the subject treated of in the lesson assigned, and he will then hold his pupils to the order he shall have determined to be the best, requiring not always the identical language of the author, but something equally exact and comprehensive. In mathematical studies, the recitation should consist largely of exercises illustrative of the principles of the text-book, involving the same process, but varied in figures and in verbal statement from the exercises given by the author.

"The teacher's aim will be to test the pupil's knowledge of the subject studied, to correct any misapprehensions he may have fallen into while studying, to ascertain what difficulties have been encountered, and to guide the pupil to the means, by use of which he may gain complete mastery over his difficulties. The recitation may be so conducted as to give the teacher information as to the accuracy of the pupil's knowledge, or so as to give the pupil information upon the best method of study. Both are important, and the occasion for either method must be determined as the recitation progresses. These things admitted, it follows, as a matter of course, that the recitation hour is not a lecture hour, during which the pupil is to receive, passively, the instructions of the teacher; nor is it the hour devoted to the solution of all difficult problems deferred till this time by indolent students; nor yet is it the time for a parrot-like repetition of what the author says. In almost every recitation the pupil should be required to trace the relation of some new fact to previously learned principles. The surest course out of any difficulty is to lead the pupil back to ground with which he is familiar, and thus by skillful questioning to let the light in upon his mind.

"Recitations should not be continued after the teacher has failed to fix, or to hold, the attention of the majority of his class.

"Questions should be so put as to require thought upon part of all the class, and not alone upon the part of him whose turn

has come to answer. As far as possible, all routine questioning should be discarded, and every pupil be made to feel that he may be called upon to answer any and every question asked."

How to use a text-book, and when and in what particulars to dispense with it, will be more fully explained under the different studies and in the instructions for the different divisions.

§ 2. ORAL INSTRUCTION.

In acting upon the suggestions given in the foregoing section, considerable oral instruction will be necessary. In fact, for the Third Grade, the instruction should be all oral. In the other grades, also, topics are assigned for which no text-books are provided. In the studies for which text-books are provided, oral instruction must almost constantly be employed to elucidate, amplify and supplement the text-book. For suggestions we can do no better than copy the following excellent remarks from the *Chicago Manual*, already quoted above:

"Properly understood and pursued, it [oral instruction] will prove of great value, both by reason of the actual knowledge gained, and more especially of the desire awakened for farther and more exhaustive study. The habits of observation it demands, and the interest it engenders, are of incalculable value to the student. The incidental advantage of leaving the pupil to the expression of his own thoughts and ideas is by no means to be despised. These benefits are proportioned to the general intelligence and tact of the teacher, and the reflex influence of 'The Oral Course' upon the faithful teacher will appear in increased teaching power. New sources of illustration are opened, and the ability to employ them is largely augmented.

"Nearly every recitation furnishes occasion for more or less incidental instruction, but the teacher who embraces every opportunity to switch off upon side issues may be sure that his time will be largely wasted. The thoughtful instructor will find some occasions that he will not dare neglect. These generally occur in the line of a well-arranged oral course prepared primarily to suit the natural order of development of the child's mind, and secondarily to fit the text-book studies.

"Very many of the topics in the Oral Course can be treated most successfully as object lessons. The presence of the object gives life to the study. But mere gossip about the object is of no avail. There must be *systematic* study. *First:* What do our senses tell us of the object presented as to color, form, taste, smell, etc.? *Second:* What can we recall of the object

when no longer seen, heard, tasted, smelled or felt? *Third:* What are its points of resemblance or of contrast when compared with other objects with which we are familiar? *Fourth:* To which of the three kingdoms of nature does it belong, and what shall be its general classification? *Fifth:* What shall we infer as to its uses and its practical value? The present knowledge of the child will determine how much time shall be spent upon each of the above divisions, but their order may not safely be changed, nor should the attention of the child be diverted from any one until some definite knowledge is gained.

"Teachers should make thorough preparation for these exercises, and be sure that their instructions are simple, concise and accurate. They should never tell a child what he may be made to tell them, and should never give any information without calling for it again.

"While a definite time should be assigned to this exercise, and, as a general rule, no deviation be allowed from the programme, still occasionally opportunities will arise when the object lesson may be more impressive than at any other time, and advantage should be taken of such favorable opportunities, though it may call up objects out of their regular order.

"Some of the facts of meteorology may be most vividly impressed upon the mind during the passage of a severe storm. The parade of a menagerie may furnish excellent opportunities for lessons upon the camel or elephant; the tact of the successful teacher will turn many such occasions to good account.

"That instruction of the character sketched above may not be entirely neglected, the topics assigned to each grade should be made a part of the examination for promotion from grade to grade, and at least of equal value with any other portion of the work of the grade. In estimating results of this examination, the expression of the pupils, own observations and thoughts upon the several topics should be counted as of more worth than any repeated words of others, which he may have been required to commit to memory. In other words, the examiner should seek to learn how much the pupil has thought, rather than how much he has absorbed.

"Nor is it desirable for the teacher to undertake too many subjects. One thoroughly understood, as far as the capacity of the pupil will permit, is better than many superficially treated. If all the subjects given as examples can be thus thoroughly understood, it is well, but if time will not permit the mastery of all, it is better that selections be made, and that the topics selected be carefully studied."

§ 3. MENTAL DISCIPLINE.

The ultimate object of all education must be mental discipline, and not the mere acquisition of knowledge. The acquisition

of knowledge is simply the means by which the mental faculties and capacities are developed. The knowledge gained is at the best but limited, and sometimes only ephemeral, and of little if any value to the pupil in after life. But the mental discipline is all important, of lasting value, and the first condition to the pupil's success in life.

Mental discipline depends upon mental labor. This labor may be of two very different kinds; first, the pupil may be simply required to understand or seem to understand the statement of the text-book, and of the teacher in oral instruction; or secondly, the pupil may be required to re-discover for himself the knowledge of the text-book. The former is unfortunately most usually if not almost universally the only labor imposed upon the pupil; and yet the latter is the only labor which can give that mental discipline which will truly educate the child.

We need to give no instructions in regard to the method to be pursued in order to so teach and drill the pupil that he is able so repeat, *verbatim et literatim*, the statements of the text-books, and of the teacher in oral instruction. Every dull, hard pedant has such methods at his fingers' end.

But we have a few earnest words for those who are striving to make the pupil really understand the text-book. The trouble with them is, that they religiously hold that the knowledge supplied by the text-book must be taught and learned by the pupil in its sequence and entirety. Sometimes even the methods of instruction prescribed by the book are held to be obligatory upon teachers; though, fortunately, a little more latitudinarianism in this respect, is creeping into the profession. If we now remember that the contents of a text-book are usually arranged, not according to the order of development, but according to the present system of the science, a part of which the book presents, it will be seen that a book which may be adapted for maturer minds is yet totally unfit for children. To illustrate:

In arithmetic, certain methods of analysis are employed in the stating and solving of problems. The value of these methods has been fully demonstrated in the case of the higher grades of scholars. Hence teachers and book-makers have concluded that a strict adherence to these methods from the

very beginning, would be the shortest and surest road to satisfactory results in teaching arithmetic. But further yet, as the elements of every study should certainly stand at the entrance to that study, the commencement of every arithmetic bristles with definitions of "arithmetic," "quantity," "numbers," "axioms," etc. All this is perhaps necessary to a full and thorough presentation of the subject as a science, but it is not only not necessary but detrimental to the education of the child. A child *cannot* be taught the science of number; it can deal with number only as a property of bodies; and as definitions are abstractions, generalizations, all definitions as introductory to a study, are worse than meaningless to a child, they are actual hindrances to its understanding of a subject. This is true in arithmetic, in geography, in grammar, in short in every study in which the introductory elements are expressed in definitions. In arithmetic, again, the child's ideas of number are, primarily, dependent upon the actual presentation of objects; and the four fundamental operations are clear enough to a child if taught by the help of objects, and without any inflexible method of analysis. And yet such inflexible method of analysis is presented even in the Primary Arithmetic as *the* method by which to insure correct arithmetical reasoning, and many teachers, unfortunately, seem to be impressed with the importance and feasibility of such method, when they find that after more or less of constant drill the pupils are at last able to solve every problem according to the prescribed analysis. And yet the whole process may involve no more real intellectual labor than is required of a trained animal in performing the task its master has taught it. We too frequently forget that explanations in set phrases may depend upon the cultivation, not of the understanding, but of the memory solely. Then, again, children may even talk about things correctly enough, and yet attach no idea to their words.

What we have said of arithmetic, is true of grammar, geography, and of it especially, and of other studies. The true method of instruction is to lead the pupil from the known to the unknown; from the concrete to the abstract, and by steps which the pupil must take himself. It is not sufficient that he understands and can repeat the steps indicated in the text book to arrive at a definite result. On the contrary, the pupil must

discover these steps without reference to the text book or aid of teacher, the teacher no more than guiding him into the correct course.

The teacher must then have a definite end in view in every lesson he assigns from a text book; he must thoroughly understand the connection between it and the preceding, and also the succeeding lesson; and he must well weigh the steps the pupil must take in order to obtain the full mental discipline the mastering of the lesson can give him. The capabilities of the pupil, the difficulties of the lessons must be studied, and determine the measure of help the pupil may require. If solely by the constant and watchful assistance of the teacher, a pupil should at last really understand a lesson, the principal mental discipline, that of gaining strength by overcoming difficulties, has been sacrificed, and the child's mind weakened instead of developed. On the other hand, all assistance can not be dispensed with; the problem is to find how much assistance is absolutely required. No inflexible rule can be devised; the individual differences of pupils must be carefully considered. This is, perhaps, the most difficult portion of the teacher's work. The thoroughness of a teacher's culture and capacity will infallibly be tested here. In conclusion we add some remarks from Mr. Quick's *Essays on Educational Reformers*, (Chap. IX, Herbert Spencer, page —.):

"I. We should proceed from the simple to the complex, both in our choice of subjects and in the way in which each subject is taught. We should begin with but few subjects at once, and, successively adding to these, should finally carry on all subjects abreast.

"Each larger concept is made by a combination of smaller ones, and presupposes them. If this order is not attended to in communicating knowledge, the pupil can learn nothing but words, and will speedily sink into apathy and disgust.

"That we must proceed from the known to the unknown is something more than a corollary to the above; because not only are new concepts formed by the combination of old, but the mind has a liking for what it knows, and this liking extends itself to all that can be connected with its object. The principle of using the known in teaching the unknown is so simple, that all teachers who really endeavor to make anything understood, naturally adopt it. The traveler who is describing what he has seen, and what we have not seen, tells us that it is in one particular like this object, and in another like that object,

with which we are already familiar. We combine these different concepts we possess, and so get some notion of things about which we were previously ignorant. What is required in our teaching is that the use of the known should be employed more systematically. Most teachers think of boys who have no school learning as entirely ignorant. The least reflection shows, however, that they know already much more than schools can ever teach them. A sarcastic examiner is said to have handed a small piece of paper to a student, and told him to write *all he knew* on it. Perhaps many boys would have no difficulty in stating the sum of their school learning within very narrow limits, but with other knowledge a child of five years old, could he write, might soon fill a volume. Our aim should be to connect the knowledge boys bring with them to the school room with that which they are to acquire there. I suppose all will allow, whether they think it a matter of regret or otherwise, that hardly anything of the kind has hitherto been attempted. Against this state of things I can not refrain from borrowing Mr. Spencer's eloquent protest: 'Not recognizing the truth that the function of books is supplementary—that they form an indirect means to knowledge when direct means fail, a means of seeing through other men what you cannot see for yourself, teachers are eager to give second-hand facts in place of first-hand facts. Not perceiving the enormous value of that spontaneous education which goes on in early years, not perceiving that a child's restless observation, instead of being ignored or checked, should be diligently ministered to and made as accurate and complete as possible, they insist on occupying its eyes and thoughts with things that are, for the time being, incomprehensible and repugnant. Possessed by a superstition which worships the symbols of knowledge instead of the knowledge itself, they do not see that only when his acquaintance with the objects and processes of the household, the street, and the fields, is becoming tolerably exhaustive, only then should a child be introduced to the new sources of information which books supply, and this not only because immediate cognition is of far greater value than mediate cognition, but also because the words contained in books can be rightly interpreted into ideas only in proportion to the antecedent experience of things.' After remarking on the wrong order in which subjects are taught, he continues, 'What with perceptions unnaturally dulled by early thwartings, and a coerced attention to books, what with the mental confusion produced by teaching subjects before they can be understood, and in each of them giving generalizations before the facts of which they are the generalizations, what with making the pupil a mere passive recipient of others' ideas, and not in the least leading him to be an active inquirer or self-instructor, and what with taxing the faculties to excess, there are very few minds that

become as efficient as they might be.' While agreeing heartily in the spirit of this protest, I doubt whether we should wait till the child's acquaintance with the objects and processes of the household, the street, and the fields, is becoming tolerably exhaustive before we give him instruction from books. The point of time which Mr. Spencer indicates is, at all events, rather hard to fix, and I should wish to connect book-learning as soon as possible with the learning that is being acquired in other ways. Thus might both the books, and the acts and objects of daily life, win an additional interest. If, e. g., the first reading books were about the animals, and later on about the trees and flowers which the children constantly meet with, and their attention were kept up by large colored pictures, to which the text might refer, the children would soon find both pleasure and advantage in reading, and they would look at the animals and trees with a keener interest from the additional knowledge of them they had derived from books. This is, of course, only one small application of a very influential principle.

* * * * * * * *

"3. 'Our lessons ought to start from the concrete, and end in the abstract.' What Mr. Spencer says under this head well deserves the attention of all teachers. 'General formulas which men have devised to express groups of details, and which have severally simplified their conceptions by uniting many facts into one fact, they have supposed must simplify the conceptions of a child also. They have forgotten that a generalization is simple only in comparison with the whole mass of particular truths it comprehends, that it is more complex than any one of these truths taken simply; that only, after many of these single truths have been acquired, does the generalization ease the memory, and help the reason; and that, to a mind not possessing these single truths, it is necessarily a mystery. Thus, confounding two kinds of simplification, teachers have constantly erred by setting out with 'first principles,' a proceeding essentially, though not apparently, at variance with the primary rule [of proceeding from the simple to the complex], which implies that the mind should be introduced to principles through the medium of examples, and so should be led from the particular to the general, from the concrete to the abstract.' In conformity with this principle, Pestalozzi made the actual counting of things precede the teaching of abstract rules in arithmetic. Basedow introduced weights and measures into the school, and Mr. Spencer describes some exercises in cutting out geometrical figures in cardboard as a preparation for geometry. The difficulty about such instruction is that it requires apparatus, and apparatus is apt to get lost or out of order. But, if apparatus is good for anything at all, it is worth a little trouble. There is a tendency in the minds of many teachers to depreciate 'mechanical appliances.' Even a decent black-

board is not always to be found in our higher schools. But, though such appliances will not enable a bad master to teach well, nevertheless, other things being equal, the master will teach better with them than without them. There is little credit due to him for managing to dispense with apparatus. An author might as well pride himself on being saving in pens and paper.

"4. 'The genesis of knowledge in the individual must follow the same course as the genesis of knowledge in the race.' This is a thesis on which I have no opinion to offer. It was, I believe, first maintained by Pestalozzi.

"5. From the above principle Mr. Spencer infers that every study should have a purely experimental introduction, thus proceeding through an empirical stage to a rational.

"6. A second conclusion which Mr. Spencer draws is that, in education, the process of self-development should be encouraged to the utmost. Children should be led to make their own investigations, and to draw their own inferences. They should be told as little as possible, and induced to discover as much as possible. I quite agree with Mr. Spencer that this principle can not be too strenuously insisted on, though it obviously demands a high amount of intelligence in the teacher. But if education is to be a training of the faculties, if it is to prepare the pupil to teach himself, something more is needed than simply to pour in knowledge and make the pupil reproduce it. The receptive and reproductive faculties form but a small portion of a child's powers, and yet the only portion which many schoolmasters seek to cultivate. It is, indeed, not easy to get beyond this point; but the impediment is in us, not in the children. 'Who can watch,' asks Mr. Spencer, 'the ceaseless observation, and inquiry, and inference, going on in a child's mind, or listen to its acute remarks in matters within the range of its faculties, without perceiving that these powers it manifests, if brought to bear systematically upon studies *within the same range*, would readily master them without help? This need for perpetual telling results from our stupidity, not from the child's. We drag it away from the facts in which it is interested, and which it is actively assimilating of itself. We put before it facts far too complex for it to understand, and therefore distasteful to it. Finding that it will not voluntarily acquire these facts, we thrust them into its mind by force of threats and punishment. By thus denying the knowledge it craves, and cramming it with knowledge it can not digest, we produce a morbid state of its faculties, and a consequent disgust for knowledge in general. And when, as a result, partly of the stolid indolence we have brought on, and partly of still continued unfitness in its studies, the child can understand nothing without explanation, and becomes a mere passive recipient of our instruction, we infer that education must necessarily

be carried on thus. Having by our method induced helplessness, we make the helplessness a reason for our method.' It is, of course, much easier to point out defects than to remedy them; but every one who has observed the usual indifference of school-boys to their work, and the waste of time consequent on their inattention, or only half-hearted attention, to the matter before them, and then thinks of the eagerness with which the same boys throw themselves into the pursuits of their play-hours will feel a desire to get at the cause of this difference; and, perhaps, it may seem to him partly accounted for by the fact that their school-work makes a monotonous demand on a single faculty—the memory.

"7. This brings me to the last of Mr. Spencer's principles of intellectual education. Instruction must excite the interest of the pupils, and therefore be pleasurable to them. 'Nature has made the healthful exercise of our faculties both of mind and body pleasurable. It is true that some of the highest mental powers, as yet but little developed in the race, and congenitally possessed in any considerable degree only by the most advanced, are indisposed to the amount of exertion required of them. But these in virtue of their very complexity will in a normal course of culture come last into exercise, and will, therefore, have no demands made on them until the pupil has arrived at an age when ulterior motives can be brought into play, and an indirect pleasure made to counterbalance a direct displeasure. With all faculties lower than these, however, the immediate gratification consequent on activity, is the normal stimulus, and under good management the only needful stimulus. When we have to fall back upon some other, we must take the fact as evidence that we are on the wrong track. Experience is daily showing with greater clearness that there is always a method to be found productive of interest—even of delight—and it ever turns out that this is the method proved by all other tests to be the right one.'

"As far as I have had the means of judging, I have found that the majority of teachers reject this principle. If you ask them why, most of them will tell you that it is impossible to make school-work interesting to children. A large number also hold that it is not desirable. Let us consider these two points separately.

"Of course, if it is not possible to get children to take interest in anything they could be taught in school, there is an end of the matter. But no one really goes as far as this. Every teacher finds that some of the things boys are taught they like better than others, and perhaps that one boy takes to one subject and another to another, and he also finds, both of classes and individuals, that they always get on best with what they like best. The utmost that can be maintained is, then, that some subjects which must be taught will not interest the

majority of the learners. And if it be once admitted that it is desirable to make learning pleasant and interesting to our pupils, this principle will influence us to some extent in the subjects we select for teaching, and still more in the methods by which we endeavor to teach them. I say we shall be guided *to some extent* in the selection of subjects. There are theorists who assert that nature gives to young minds a craving for their proper aliment, so that they should be taught only what they show an inclination for. But surely our natural inclinations in this matter, as in others, are neither on the one hand to be ignored, nor on the other to be uncontrolled by such motives as our reason dictates to us. We at length perceive this in the physical nurture of our children. Locke directs that children are to have very little sugar or salt. 'Sweetmeats of all kinds are to be avoided,' says he 'which, whether they do more harm to the maker or eater is not easy to tell.' (Ed. § 20.) Now, however, doctors have found out that young people's taste for sweets should in moderation be gratified, that they require sugar as much as they require any other kind of nutriment. But no one would think of feeding his children entirely on sweetmeats, or even of letting them have an unlimited supply of plum-puddings and hardbake. If we follow out this analogy in nourishing the mind, we shall, to some extent gratify a child's taste for stories, whilst we also provide a large amount of more solid fare. But although we should certainly not ignore our children's likes and dislikes in learning, or in anything else, it is easy to attach too much importance to them. Dislike very often proceeds from mere want of insight into the subject. When a boy has 'done' the First Book of Euclid without knowing how to judge of the size of an angle, or the Second Book without forming any conception of a rectangle, no one can be surprised at his not liking Euclid. And then the failure which is really due to bad teaching is attributed by the master to the stupidity of his pupil, and by the pupil to the dullness of the subject. If masters really desired to make learning a pleasure to their pupils, I think they would find that much might be done to effect this without any alteration in the subject taught.

"But the present dullness of school-work is not without its defenders. They insist on the importance of breaking in the mind to hard work. This can only be done, they say, by tasks which are repulsive to it. The school boy does not like, and ought not to like, learning Latin grammar any more than the colt should find pleasure in running round in a circle; the very fact that these things are not pleasant makes them beneficial. Perhaps a certain amount of such training may train *down* the mind and qualify it for some drudgery from which it might otherwise revolt; but if this result is attained, it is attained at the sacrifice of the intellectual activity which is necessary for

any higher function. As Carlyle says, when speaking of routine work generally, you want nothing but a sorry nag to draw your sand-cart; your high-spirited Arab will be dangerous in such a capacity. But who would advocate for all colts a training which should render them fit for nothing but such humble toil? I have spoken elsewhere on this subject, and here I will merely express my strong conviction that boys' minds are frequently dwarfed, and their intellectual pursuits blighted, by the practice of employing the first years of their school life in learning by heart things which it is quite impossible for them to understand or care for. Teachers set out by assuming that little boys can not understand anything, and that all we can do with them is to keep them quiet and cram them with forms which will come in useful at a later age. When the boys have been taught on this system for two or three years, their teacher complains that they are stupid and inattentive, and that so long as they can say a thing by heart, they never trouble themselves to understand it. In other words, the teacher grumbles at them for doing precisely what they have been taught to do, for repeating words without any thought of their meaning.

"In this very important matter I am fully alive to the difference between theory and practice. It is so easy to recommend that boys should be got to understand and take an interest in their work—so difficult to carry out the recommendation! Grown people can hardly conceive that words which have in their minds been associated with familiar ideas from time immemorial, are mere sounds in the mouths of their pupils. The teacher thinks he is beginning at the beginning if he says that a transitive verb must govern an accusative, or that all the angles of a square are right angles. He gives his pupils credit for innate ideas up to this point, at all events, and advancing on this supposition he finds that he can get nothing out of them but memory-work, so he insists on this that his time and theirs may not seem to be wholly wasted. The great difficulty of teaching well, however, is after all but a poor excuse for contentedly teaching badly, and it would be a great step in advance if teachers in general were as dissatisfied with themselves as they usually are with their pupils.

"Mr. Spencer and Professor Tyndall appeal to the results of experience as justifying a more rational method of teaching. Speaking of geometrical deductions, Mr. Spencer says: 'It has repeatedly occurred that those who have been stupefied by the ordinary school-drill—by its abstract formulas, its wearisome tasks, its cramming—have suddenly had their intellects roused by thus ceasing to make them passive recipients, and inducing them to become active discoverers. The discouragement caused by bad teaching having been diminished by a little sympathy, and sufficient a perseverance excited to achieve a first success, there arises a revolution of feeling affecting the

whole nature. They no longer find themselves incompetent; they too can do something. And gradually as success follows success, the incubus of despair disappears, and they attack the difficulties of their other studies with a courage insuring conquest ' "

The following will indicate the most efficient means of securing the greatest amount of mental discipline in oral instruction. The means to be used in text-book instruction and recitations will be indicated under the several branches of study:

"1. *The teacher, in all the instruction which he gives, must study a strict order of thought, and an easy and simple manner of presenting his thought.* Every lesson upon a given subject must be a discourse complete in itself, whose separate groups of thoughts the teacher has so to divide, give prominence to, and distinctly mark, that they are clearly distinguished by the scholar's perception also. The more smooth and measured the recital of the teacher, or his description of subjects belonging to the domain of natural history, or other subjects, the sharper he, on the one hand, draws the line between the separate thoughts, while on the other, he makes his pupils also sensible and conscious of the relation of the separate thoughts to each other, so much the greater will become the capability and inclination of his pupils to direct their attention to the unity of the discourse, and to arrange, in their proper order, groups of thoughts, according to their divisions and subdivisions; in a word, to understand the discourse.

"2. *In all recitations the pupils must be accustomed to give their answers in the form of complete sentences, and, by degrees, to express themselves more and more fully in regard to what they have heard or seen.* Such a demand upon the scholar forces him at the same time to follow the teacher with the strictest attention. Thus it is judicious perseveringly to maintain with the pupil a loud, distinct, and smooth tone of speech. The pupil must also learn to take time for his own utterance, to observe his thoughts, their order, and connection."—[*Fundamental Principles of Teaching Language, Cal. Teacher*, June, 1873.]

§ 4. READING.

The aim in teaching reading, is to make the language of literature intelligible to the pupil. This includes the intelligent comprehension, first, *of the thoughts expressed by the author*, and secondly, *of the manner in which these thoughts are expressed.* The latter is possible only when the former has been secured. Our first task is, then, to guide the learner to the intelligent com-

prehension of the thoughts expressed by the author. Let us now examine the composition of a complete reading lesson.

1. "One main thought underlies as groundwork of the separate thoughts, and these latter group themselves around the former, and, in subordination to it, flow together in unity. The main thought is the product, the result, the total abstract of the thoughts belonging to it.

2. "These separate thoughts, whose product is the main thought, again divide themselves into larger or smaller groups of thoughts, which groups consist of a number of opinions or propositions, ever subordinate, however, to the piece taken as a whole.

3. "Finally, we come to what is called in the study of language a sentence; the sentence, again, is a unit, composed of separate parts. Further, around the principal sentence we find dependent sentences grouped, and around the subject and predicate of a simple sentence the other members of the sentence.

4. "Every part of a sentence consists of words which have for their foundation a certain sense or meaning, idea or conception."

The first requisite in reading, is, then, that the pupil possesses the mental capacity to understand the piece as a whole, and to be able to grasp and hold fast to the main thought.

Secondly, he must be able to distinguish for himself the principal and subordinate, or major and minor parts of the piece, to be conscious of them, and also of their relation to the piece as a whole.

Thirdly, he must be able to feel mentally conscious of the single parts of a sentence, and of their relations to each other, and to the whole sentence.

The fourth and last requirement is that the pupil knows or is able to find out the sense or meaning of the words composing every part of a sentence, and unite them into the idea, or conception, or thought which that part of the sentence is intended to express.

In teaching reading we must follow a reverse order from the above; and the fourth and last requirement, becomes the first. The following instructions will indicate to the teacher the manner of securing, successively, the above mentioned requisites.

1. *The teacher must read to his pupils with clear, distinct accentuation, suited to the meaning, every piece selected as a reading lesson.* The purpose of this reading by the teacher is to furnish the pupils with a necessary model, and, at the same time, to make

it easier for them to understand the piece; and it is principally by the manner of accentuation—something which cannot be expected from children—that the reference and relation of the thoughts to each other is made intelligible and comprehensible.

2. From the very begining pupils must be required to form the habit of loud, distinct reading, in which the punctuation marks, or dividing points are rigorously observed. Every sound, every syllable, every word, every phrase, every simple sentence in a compound sentence, and also the latter itself as part of the whole, must be brought out, well cut and sharply defined by the voice; thereby the scholar finally attains also to the conscious perception of every separate thought contained in the piece read, together with the images and ideas thereof. It becomes continually more and more possible for him to gain an insight into the organism of language in its unity.

3. The reading lesson is to be read by teacher and by pupils in conformity with the foregoing requirements, and, when too long or when the ability of the pupils is insufficient, then by questioning, let it be drawn out by sections or paragraphs from the pupils themselves, or, where possible, let them repeat it by sections.

4. Unintelligible or obscure expressions which, in reading, questioning, and recitation, have been brought to the notice of the teacher, are to be explained to the pupils and erroneous ideas corrected.

5. The reading lesson is to be considered in its separate sections—that is, the principal or larger groups are to be noticed.

6. The different thoughts contained in the separate sections or larger groups of thoughts, are to be so brought out that the learner becomes aware of them. By mere reading, these thoughts pass in too quick succession through the child's mind, so that, often, the child does not know what he has read.

7. The particular manner of utterance or expression of these separate thoughts is remarked upon, also the reference or relation of these thoughts to each other. Here the attention is to be fixed upon the separate sentences of the reading lesson, and the pupils must learn to perceive the signification of the phrases and separate parts of the sentence, their relation to the complete sentence and the ideas and forms of words, etc., thus introduced.

We append some more definite instructions, again taken from the *Chicago Revised Course of Instruction:*

"To test the accuracy of the child's knowledge of what he reads, he should be encouraged to alter sentences, substituting for some selected words, words of his own choosing, that shall change the form but not the meaning of the passage. This exercise may embrace at first but a single word in each sentence, and then may be extended as the capacity of the pupil may seem to warrant, until nearly or quite all the words are changed. In the more advanced classes, poetical selections may be changed into prose. While the definitions given by the author should not be neglected, the child should be encouraged, so far as possible, to give definitions of his own; and should be permitted, as indicated above, to put his definition into the place of the words defined, and then to read the sentence he has changed. This test may be still further extended by requiring the pupil to embody the selected words in sentences of his own construction. If the teacher finds difficulty in securing proper expression in any particular way, the remedy may be found in asking a question, the proper answer to which would be the difficult passage, and in requiring the pupil to give the passage as an answer to the question asked.

"The advantages of concert-reading will not pay for a single bad habit formed by its careless use. The attention of the class may be kept by other methods, one of which is of importance in the recitations as well—that is, calling your scholars out of their regular order of standing or sitting; and, if need be, calling upon the same person two or three times, until the impression that he will be called on but once is entirely dissipated. Answers to general questions connected with reading lessons may be given in concert. The enunciation of elemental sounds may also be given in concert. Poetical selections which are already measured, may also be given in concert, with less difficulty and with less danger than prose.

"While a class is engaged in reading, the undivided attention of the teacher should be given to it. If the attention of the teacher be called away necessarily, the exercise should be suspended.

"Children should be encouraged to criticise each other fairly and justly. Raising the hand during the progress of the reading should not be allowed; but, at its close, those who have noticed errors should have an opportunity of correcting them, provided always that the critic can illustrate his own criticism. This should be occasionally tested.

"An excellent teacher gives as the result of her experience, this important caution: 'Children must be taught to open their mouths before they can become good readers.' The importance and value of this suggestion are fully confirmed by the experience of all good teachers.

"Frequent exercises, varied according to the advancement of pupils, in the utterence of elementary sounds, single and combined, should be most faithfully attended to before each exer-

cise in reading. * * * * While good articulation is not the *end* of reading, it is an essential *means*, and one without which the true end—expression of thought—can never be attained.

"There is no fault more common in reading than that of stumbling, hesitating, catching and repeating. It is but one fault, and teachers should use every effort to break it up. The moment the child shows the first symptom, his case should be carefully but immediately considered, and strict attention at once given to its cure. It sometimes arises from the child's vocal organs getting the start of his thoughts, and should be cured by a little hard study, until the pupil becomes familiar enough with the thought to have his mind keep ahead of his voice. It sometimes arises from pure carelessness, and its cure needs no mention. It often arises from the use of books in advance of the child's capacity, so that reading becomes mere utterance, without so much as a thought creeping in even behind a word uttered. The case suggests its own remedy. It sometimes arises from indulgence in a similar habit in all other recitations. Whatever its cause, its cure must be certain, or no progress is made, but on the other hand constant retrogression.

"Improper breathing has much to do with poor reading, and a variety of breathing exercises should be practised in connection with each lesson. Among those most beneficial may be mentioned: slow and silent inhalation and exhalation; quick inhalation and very slow and silent exhalation; quick inhalation and explosive exhalation; slow and silent inhalation and explosive exhalation; quick inhalation and slow exhalation, with the utterance of some simple vowel sound; slow inhalation and explosive exhalation, with the utterance of some simple vowel sound, etc. All these exercises should be practised by the class, standing squarely and fairly upon their feet, with shoulders thrown back and head in its natural position."

The several readers give abundant phonic and elocutionary rules and exercises. If time permits, the exercises given in Murdock and Russell's *Vocal Culture* may be taken up. The book should be in every school library.

Special attention should be paid to the reading of poetry. It is just as easy to train children from the very commencement to read poetry according to the rhythm, poetical pauses, etc., as to permit them to acquire the so common sing-song style of reading poetry. In the Fourth Reader all needed instructions are given. Of course, in the divisions of the third grade, the pupils are not to scan the poetry before reading it. The teacher simply insists that the pupils read as he reads—emphasizing syllables, making pauses, etc., as they hear the teacher do.

DEPARTMENT OF PUBLIC INSTRUCTION.

IN THIS number we begin the publication of the long promised *Manual*. In a month or two we shall devote the TEACHER to this work exclusively. Teachers are particularly requested to look after the filing of at least the copy sent to the District Clerk for the District Library.

SUFFICIENT COPIES of the new School Law have been mailed to each County Superintendent to give two copies to each district; one to the District Clerk for the use of the Board of Trustees, and one to the District Library for the use of the teacher. All copies supplied to school officers, are State property and must be delivered to successors in office.

WE CALL ONCE MORE ATTENTION to section 1859, which provides that "on and after the first day of July, 1875, no school district is entitled to receive any apportionment of State or county school moneys, which has not maintained a public school for at least six months during the then next preceding school year; but any new district formed by the division of an old one, is entitled to its apportionment when the time that school, maintained in the old district before division, and in the new district after division, is equal to at least eight months." The present school year, from July 1, 1874 to June 30, 1875, is the preceding school year mentioned above. So that districts, in order to be entitled next year to any public school moneys, must keep this year at least a six months' school.

TRUSTEES will please bear in mind an amendment made by the last Legislature to section 1621. All school moneys received from the State or county apportionments must be used exclusively for the support of schools for that school year, until at least an eight months' school shall have been maintained. Heretofore it has been the practice, in some instances, to maintain a school say three months, and to use the balance to the credit of the district to pay any outstanding indebtedness or to use it as a building fund. We may state, in this connection, that no school moneys, whether received from State or county apportionments, can be used for building purposes or the purchase of a school house or lot. All such diversion of school funds is illegal and must be prevented by County Superintendents. All school moneys received by a district from July 1, 1874, to June 30, 1875, must be used for paying teachers' salaries for services rendered between July 1, 1874, and June 30, 1875, excluding all claims for services rendered prior to July 1, 1874, and for the incidentals authorized by law, incurred during the same period. We recur to this subject, as an appeal has been again taken to us, in a case where a Board of Trustees propose to pay out of school moneys received or to be received from and after July 1st, a teacher's salary for services rendered prior to said first of July, and we are assured that the County Superintendent not only sanctions but favors such a misappropriation of school moneys. If the County Superintendent does allow it, he commits malfeasance in office, and can be punished therefor; the Trustees are in the same position.

ALL TRUSTEES' ORDERS drawn prior to the first of July, cannot be recognized by the County Superintendent, except at the close of the school year, except there was a balance to the credit of the district out of which the order may be paid wholly or in part. All Trustees' orders against the school funds apportioned or to be apportioned to the district since July 1st, must be dated subsequent to June 30th, and must be for teacher's salary or incidentals incurred since June 30.

IN QUITE A NUMBER OF COUNTIES, districts having less than fifty census children will receive their full apportionment of $500 from the county school money apportioned before the February State apportionment is made; and the February State apportionment will therefore be divided exclusively among the districts having not less than fifty census children. As the Library Fund is derived from State apportionments only, quite a number of districts might then be deprived of a Library Fund. To avoid doing this we propose to County Superintendents the following method of apportioning the school moneys. As an illustration let us take San Mateo County. In the early part of next January, if not before, the Superintendent will know how much county school fund is derived from the county taxes. Let us assume that $10,000 are so raised. From the State, the county will receive probably $15,000. This gives us $25,000 as the total school fund, 2-5ths of which are county funds, and 3-5ths State funds. So that we may assume that of the $500 apportioned to a district, 2-5ths or $200 are to be derived from the county school fund, and 3-5ths or $300 from the State school fund. Ten per cent. of the latter or $30, will be the amount of Library Fund for the district. In general, find the probable proportion of county school funds to State school funds to be apportioned during the year, and assume that the $500 apportioned to a district, are derived, in a like proportion, from the county and State school funds. Ten per cent. of the proportion of State school funds thus found, will give the amount of Library Fund a district will have.

TRUSTEES are now authorized to expend the Library Fund in the purchase of school apparatus as well as books for a school library. The indispensability of school apparatus ought to induce Trustees to think of supplying their school first with apparatus and then with Library Books. Under apparatus we include: Wall maps, globes, physiological charts, arithmetical frame, abacus, box of forms and solids, reading charts, set of weights and measures, measures of length, the different books on Object Teaching and Lessons named in the Course of Studies, etc. etc.

ACCORDING to subdivision 2 of section 1521, the State Board of Education has the power and it is its duty "to prescribe and enforce rules for the examination of teachers." Up to November 11, 1871, the State Board of Education did not act upon this provision. At the meeting held on the day just mentioned, a committee was appointed "to report to the next meeting of the Board, regulations for examinations of teachers by State, City and County Boards of Examination." At the next meeting of the Board, the Committee asked for and were granted further time. At the meeting held December 13, 1872, the Committee finally reported. At three subsequent meetings additional rules were prescribed. But many of the

rules prescribed were made part of the School Law by the last Legislature, and one or two rules were modified or repealed. The following are the only rules prescribed by the State Board of Education which are not incorporated in the Law, and which are at present in force:

The minimum percentages for State Certificates is as follows: 85 per cent. for First Grade; 80 per cent. for Second Grade, and 75 per cent. for Third Grade.

The minimum percentage for County Certificates is: 80 per cent. for First Grade; 75 per cent. for Second Grade; 60 per cent. for Third Grade.

The State Board of Examination is instructed to furnish the same examination questions for all grades, so far as the studies are prescribed by law.

County Boards of Examination are instructed not to renew Third Grade Certificates.

Applications for Life Diplomas must be accompanied by a recommendation of the County Superintendent of the county in which the applicant resides.

SECTION 1751 provides "that the State Board of Examination may grant State certificates to those who, in examinations before County Boards, have attained *the standard of efficiency prescribed by the State Board of Education; provided*, that the original examination papers be forwarded to the State Board of Examination within fifteen days after the close of the examination." The italics in the above are our own, and are employed to draw attention to a provision which is frequently violated by County Boards. For, in June, we received quite a number of papers from applicants who had not reached the prescribed standard of proficiency to entitle them, upon the markings of the County Boards, to State certificates. To send such papers is in violation of law. Then, again, papers were sent, which had not been examined at all, at least as far as we could judge, for no credits had been given, no results marked on the papers, and no report accompanied the papers. One set of papers, belonging to Mary E. Lynch, came in such a shape that we do not know to the present date from which county it was sent, and the State Board has not been able to pass upon the papers. We have tried hard to make the sending of examination papers, as much as possible, routine work, but the heedlessness of some County Superintendents baffles our endeavors. Though we have referred to this subject *ad nauseum*, it seems that with every recurrent examination the same instructions and warnings must be given. We hope that this is the last time we are compelled to recur to this subject. Our instructions to County Boards are:

1. Examine the applicants in *all* the papers sent by the State Board. The law requires that applicants be examined *by written and oral questions* in the different studies. Questions for the written examinations alone are furnished by the State Board; the oral questions and exercises must be prepared by the respective Boards, except in mental (or oral) arithmetic for which the State Board prepares a paper.

2. Credit the papers, and see whether the applicants for State certificates have reached the minimum percentage prescribed by the State Board of Education, *for State certificates*. Send the papers of those only who have reached this percentage.

3. Enter on the blank sent from this department, the name of the applicant, the name of the county, and opposite to each study, the credits given in the written examination, except in mental arithmetic, oral grammar and reading, for which the credits given in oral examination must be entered. Sum up the credits, divide by 925, and mark the percentage thus formed. Do not date or sign the blanks.

4. Certify to the State Board that the questions were not opened till the day of examination, and then in the presence of at least one member of the Board, other than the County Superintendent; that the examination was conducted in accordance with law, and the rules and regulations prescribed; and that the applicant has given evidence of good moral character. A separate certificate for each applicant is not required; include all the applicants in one certificate.

5. Put together into one package all the papers of the applicant, including the answers to the "General Questions," and the report and certificate above specified under 3 and 4. Send this package within fifteen days after the close of the examination, that is, from the time the applicants were dismissed as having finished their examination. Send the package either by Wells, Fargo & Co's Express, at the sender's cost, or by mail, *full letter postage prepaid*—three cents for every half an ounce or fraction thereof. Any set of papers not sufficiently prepared will not be taken out of the Post Office. Section 1756 has been repealed.

Failure to comply with any of the above requisites will entail the rejcetion of the set of papers. In conclusion we desire to state that all papers must be written in ink, and *not in pencil;* and County Boards are requested to call the special and constant attention of candidates to the "Rules and Regulations," and especially to the rules four and seven, reading: "Write on only one side of each sheet of paper, number your pages, leave a margin, divide into paragraphs, and do not crowd your words. Paper is cheap; write in a large legible hand, and thereby save the examiners much vexation of spirit, and yourselves some extra credits. In arithmetic, separate every operation by ruled lines across the page, or by a blank space. Make large figures, and do not mix up operations." It would not be amiss to exact also correct orthography, and some semblance of having studied grammar and composition. The persistency with which these matters are ignored in the great majority of cases, moves us to this request.

LIST OF DIPLOMAS AND CERTIFICATES granted by the State Board of Examination from April 10th, to July 18, 1874. The date immediately following the name, gives the time of the expiration of the diploma or certificate.

Educational Diplomas.

Ables, Thomas J., June 27, 1880.
Beck, Mrs. N. B., June 5, 1880.
Biggs, Thomas, June 27, 1880.
Breschen, Seraphine, July 18, 1880.
Brophy, M., May 22, 1880.
Case, E. L., May 22, 1880.
Curragh, J. M., July 18, 1880.
Du Bois, John B., June 27, 1880.
Duenkel, William, July 18, 1880.
Garrison, Gazena A., July 18, 1880.
Hall, Maggie J., June 27, 1880.
Hawkins, J. O., June 27, 1880.
Hunt, B. E., June 27, 1880.
Kelton, Mrs. Mary A., June 27, 1880.
Lafferty, I. N., June 27, 1880.
Marvin, Miss A., June 27, 1880.
Palmer, Miss R. M., June 27, 1880.
Parker, James L., June 27, 1880.
Peachy, Thomas G., July 18, 1880.
Rattan, V., May 22, 1880.
Robertson, George B., June 27, 1880.
Sankey, Mrs. Marry J., July 18, 1880.
Walker, Charles H., June 27, 1880.
Webb, Sallie B., June 27, 1880.

First Grade Certificates.

Adams, Clara A., May 22, 1878.
Anderson, George P., June 27, 1878.
Ashley, Ella E., July 18, 1878.
Barbour, William R., July 18, 1878.
Bightmire, S. A., May 22, 1878.
Black, Mattie C., June 27, 1878.
Blaisdell, Sabine Wales, July 18, 1878.
Langan, George, May 22, 1878.
Leach, Mira, July 18, 1878.
Mathews, Mary, May 22, 1878.
McHugh, Peter, June 27, 1878.
Metcalf, Mary F., May 22, 1878.
Morton, Sarah E., July 18, 1878.
Mumford, Mrs. M. E., July 18, 1878.

Brown, Charles W , July 18, 1878.
Caldwell, Mrs. M. E., May 22, 1878.
Campbell, Ruth G., June 27, 1878.
Carlisle, Cannie, July 18, 1878.
Chamberlain, Cynthia R., June 27, 1878.
Childs, Helen, June 27, 1878.
Church, W. S., July 18, 1878.
Clark, Mary E., July, 18, 1878.
Drake, Charles M., July 18, 1878.
Eastman, Augusta, May 22, 1878.
Ennis, Charles, July 18, 1878.
Featherly, Henrietta, May 22, 1878.
Finney, Miss F. A., June 27, 1878.
Fleming, Katy, July 18, 1878.
Germain, Sallie, July 18, 1878.
Gillis, Hudson B., July 18, 1878.
Goode, Richard, July 18, 1878.
Green, Kate F., May 22, 1878.
Hall, Mary C., July 18, 1878.
Heney, Julia A., July 18, 1878.
Hickman, J. B., July 18, 1878.
Hill, Eugenio K., June 27, 1878.
Hill, Mrs. Nettie G., July 18, 1878.
Hixon, George C., July 18, 1878.
Hogan, Mary J., June 27, 1878.
Inskip, Ph Seward, July 18, 1878.
Johnson, Samuel E., July 18, 1878.
Kaplan, Marie E., July 18, 1878.
Kinkade, Letitia, July 18, 1878.
La Grange, Anna E., May 22, 1878.
Nash, Miss B. S., July 18, 1878.
Oglesby, M. A., May 22, 1878.
O'Leary, Katy R., May 22, 1878.
Oliver, Jos. Campbell, July 18, 1878.
O'Loughlin, Nellie, May 22, 1878.
Palmer, Anna M., May 22, 1878.
Palmer, Maggie H., July 18, 1878.
Parker, Flora A., July 18, 1878.
Perrigo, Mary J., May 22, 1878.
Peter, N. Effie, June 27, 1878.
Phillips, Mrs. A. M., June 27, 1878.
Roche, Constantine V., July 18, 1878.
Royce, Ella J., June 27, 1878.
Ruddock, John C., May 22, 1878.
Seeber, Zenaide, May 22, 1878.
Sherman, Ella Imogene, June 27, 1878.
Smith, John W., June 27, 1878.
Soward, Frank D., July 18, 1878.
Tanner, Olive D., June 27, 1878.
Thompson, Helena A., May 22, 1878.
Tyler, Ada M., May 22, 1878.
Walbridge, Jennie M., June 27, 1878.
Walter, Emlyn, July 18, 1878.
Ward, Mary A., May 22, 1878.
Watson, Miss M. H., May 22, 1878.
Watts, Nellie G., July 18, 1878.
Wenk, Robert E., July 18, 1878.
Wicks, John T., June 27, 1878.
Wolfe, Mary E. G., July 18, 1878.
Younger, Maggie, July 18, 1878.

Second Grade Certificates.

Anderson, Mrs. Emma W., May 22, 1877.
Armstrong, Jennie, July 18, 1877.
Cave, Hattie, May 22, 1877.
Clow, Amelia B., May 22, 1877.
Duggan, Amelia, July 18, 1877.
Forsyth, Enna D., July 18, 1877.
Gilmer, Mattie C., July 18, 1877.
Goudy, Lizzie, July 18, 1877.
Graves, John T., July 18, 1877.
Johnson, Julian W., July 18, 1877.
McDonald, Annie, July 18, 1877.
McGilvray, Mrs. M., July 18, 1877.
McLellan, G. W., July 18, 1877.
Miranda, Petra, June 27, 1877.
Orth, Clara Louisa, July 18, 1877.
Phelps, Hannah J., July 18, 1877.
Pitcher, Charlotte, July 18, 1877.
Spencer, Rebecca, June 27, 1877.
Sutherland, Frances, July 18, 1877.

Third Grade Certificates.

Adams, Sallie L., July 18, 1876.
Campbell, Kate A., May 22, 1876.
Clow, Mary B., May 22, 1876.
Kroff, Sophie, July 18, 1876.
Phelps, Mrs. Eliza T., July 18, 1876.
Shaw, Ella B., July 18, 1876.

EDITORIAL DEPARTMENT.

In California, considerable attention has been drawn to the desirability and necessity of establishing Industrial and Labor Schools. No practical results were reached by the late Legislature. Iowa seems to have been more fortunate in at least paving the way for the establishment of such schools, and of connect-

ing them intimately with the common school system. Iowa passed a law called the *Industrial Exposition Law*, which we find published in the *National Normal* for August, and which we herewith copy. According to the State Superintendent of Iowa, the expositions provided for by the law have already been inaugurated in many schools, and as far as reported, with decided success. though the law is not yet in force, nor generally published. The law reads as follows:

SECTION 1. Be it enacted by the General Assembly of the State of Iowa, that it shall be the duty of the Board of Directors of independent school districts and the sub-director of each sub-district, if they should deem it expedient, under the direction of the County Superintendent, to introduce and maintain an industrial exposition in connection with each school under their control within this State.

SEC. 2. That these expositions shall consist of useful articles made by the pupils, such as samples of sewing and cooking of all kinds, knitting, crocheting, and drawing, iron and woodwork of all kinds from a plain box or horse shoe to a house or a steam engine in miniature. also, all other useful articles known to the industrial world, or that may be invented by the pupils in connection with the farm and garden products in their season, that are the results of their own toil.

SEC. 3. That the pupils be required to explain the use and the method of their work, and kind and process of culture of farm and garden products.

SEC. 4. That the parents and friends of the pupils be allowed and requested to be present and aid in the exposition.

SEC. 5 That ornamental work be encouraged when accompanied by something useful made by the same pupil.

SEC. 6. That these expositions be held in the school room upon a school day as often as once a term, and not oftener than once a month.

IN THE SAME NUMBER of the *Normal* appears an editorial on "*School Expositions*," which seems to have been written on reading the above law. Though not fully indorsing the soundness and value of the whole article, we yet think the article is so suggestive in many particulars that we deem it worth the serious attention of our readers. With this we shall leave the subject till next month:

"The danger of ordinary public exhibitions of schools is that they will pervert the regular order of school exercises into a special preparation for the public display. In this way, public examinations have sadly misled the managers of school dutics. The extent of this torsion can only be adequately realized by comparing in one's mind what the daily work of a teacher would be, if there were no examinations to drill for, with what they are under the existing pressure of final examinations.

"Ordinary exhibitions involve the same difficulty. A good closing exhibition means that the school must do little regular work three weeks before such an exercise. So inevitable is this, many of our best teachers consider a successful exhibition a discredit rather than a credit to the teacher.

"Even regular commencement exercises are open to this drawback. The work of the performance is neither parallel nor continuous with all of the regular school work. Yet of the ordinary displays of this kind, this is perhaps the least objectionable. For in the preparation of an original essay and its delivery before an audience, are involved most of the regular school activities. It is. in a way, a good resultant of the many forces developed by the pupil in his legitimate school work. His discipline, his reading, his power of investigation and general culture, are involved in its preparation, and in its delivery are displayed that power of presence and individuality, which, in a true schooling, are reckoned essential. Yet the naturally endowed pupil will here appear at a great advantage over many of his fellows, who would themselves have the advantage if solid work in other than literary directions could be exhibited.

"Now is there not some kind of public exhibition which can be made to show the work done by each pupil during the whole preceding term or year, and can-

not this display be so contrived that its anticipations shall be, to the pupils, a constant incitement to diligence and thoroughness in the regular duties of school life?

"The regular school work consists of study and recitation in Writing, Drawing, Music, Reading, Grammar, Geography, Arithmetic or Mathematics, Physiology, Natural Philosophy, Botany, Chemistry, etc., etc., according to the grade of the school. Will the regular study of these subjects yield practicable material for an exhibition? Let us take each one and see:

"In *Writing*, what more needed and better incentive to neatness, regularity and industry could be placed before the pupils, than the understanding that all of their copy-books are to be displayed on the last day of school? We imagine that this future consideration would save many a blot, induce less haste, and improve the quality of writing at the expense of quantity.

"Upon the *Drawing* exercise we need not comment. But how justly due the excellent pupils in this line, is the opportunity that their good works should have public recognition.

"*Music* always constitutes a pleasant variety in public demonstrations. Let the teacher see to it, that his pupils in this subject, have such preparation as will enable them, on the last day, to make this study serve its only possible use, namely, the entertainment of their fellows. In many of our best graded schools, drawing and music alone are made to furnish the material for a grand public display.

"In *Reading* classes, quantities of material the result of regular work can be easily accumulated. The written (or printed) lessons of the a-b-c-darians should be carefully preserved. It is generally admitted that the best method of conducting reading classes of all grades is by having most of the lessons written. Add to this the occasional compositions which result from a well conducted reading class, and the written spelling lessons (with all the errors) and you have abundant material to attest the faithfulness and skill with which the pupils of this study have applied themselves.

"The *Grammar* classes will all contribute their written lessons, for by this method is Grammar most appropriately as well as thoroughly taught.

"The *Geography* classes will contribute their maps, all the more neatly and thoroughly drawn because of this expected exhibition.

"The *Arithmetic* classes will furnish those neatly written solutions of difficult examples given them by the teacher from sources outside of the regular text book. Let the slipshod, illogical appearance of examples as usually put upon their slates or the board by arithmetic pupils be once considered, and the necessity of such preparation of their lessons as will require neatness and order as well as correctness, will be confessed. So in all the higher branches of mathematics.

"The *Physiology* classes will bring those beautiful outlines in the preparation of which thorough investigation and patient study are unavoidable.

"*Botany* as a study requires the collection and preservation of plants. If it is worth studying at all, it is worth while to have herbariums formed. At least the plant records have been faithfully kept and can be exhibited. Besides these there are the original outlines—an indispensable result of this study.

"*Geology* will furnish the cabinets of minerals and fossils collected by the pupils.

"*Natural Philosophy* will result in the preparation of working apparatus which the originators will be pleased to exhibit.

"*Zoology* will supply cabinets of preserved insects, and stuffed birds and other animals, and such skeletons as the care and interest felt by the pupils will lead them to preserve.

"*Chemistry* will furnish interesting experiments which may be repeated before visiting throngs.

"Thus we see that the regular work of each class may be improved by being made to employ its products in this final display of the school work.

"Now let us make arrangements for the exhibition of these results. This we will call an

"EXPOSITION.

"*First*. Engage the largest hall in the village, or use your school room if necessary.

"*Second.* Spread out upon the tables a portion of the materials, so that they will appear neat and attractive. Place one or more pupils in charge of this to exhibit and explain.

"*Third.* Place upon the walls the maps and drawings and herbariums, putting in charge suitable persons.

"*Fourth.* Let each pupil exhibit his own cabinet and philosophical apparatus.

"*Fifth.* Adorn the room with flowers and plants. Construct one or two fountains so that they can play during the exhibition.

"*Sixth.* During the exhibition have a band playing and intersperse vocal music prepared by the regular music classes.

"*Seventh.* Invite everybody to come free of charge.

"*Eighth.* Or charge a slight admission fee to meet necessary expenses or to purchase an organ or some other needed school furniture."

EDUCATIONAL ITEMS.

CALIFORNIA.

THE School of Design conducted under the auspices of the San Francisco Art Association, by Virgil Williams, has concluded its first term and is now open to criticism. The predictions of the lovers of art, who were unanimous in the choice of Mr. Williams for the difficult position of director of the institution, have been satisfactorily realized. The culture and personal magnetism of this fine artist and gentleman were of great value in the advancement of the school. The pupils took to him kindly from the first, and have manifested entire confidence in his ability to discharge the duties of a teacher. The membership of the school has increased from forty to sixty, and the average attendance has exceeded the expectations of all who have watched with kindly interest the progress of the institution. Fifteen of the pupils give their attention to painting, and of these two or three have developed promising taste in still-life pictures. The course adopted and strictly followed by Mr. Williams seems to be highly appropriate. He aims at thoroughness, and grounds the young ladies and gentlemen in the primary principles before allowing them any latitude. The pupils first sketch from the flat, next draw from the casts, and finally painting is tried. The opinion generally prevails that the School has made gratifying progress, and is destined to prosper under its present devoted manager.—*Bulletin.*

SACRAMENTO.—The total expenditures of the School Department of Sacramento City during the past school year were $85,472 57, being an excess over receipts of $1,950. The number of teachers in primary schools is twenty. The average attendance of pupils is 747. In the intermediate schools the number of teachers is eleven, and the average attendance of pupils 579. In the ungraded schools two teachers are employed. One teacher had charge of the night school, and the average attendance was twenty. Three regular teachers are employed in the High School. The average attendance was 69. At the grammar school 753 pupils were enrolled, and the average attendance was 533.

MUTUAL AID SOCIETY.—The San Francisco Teachers' Mutual Aid Society numbers 87 members, and although it has been in existence less than a year, has upwards of $2,000 in bank. The following officers of the Society were recently elected: President, Miss Carrie Field; Vice-Presidents, Miss Mary Murphy, Mrs. Griffith, Miss. A. Humphries, Miss Ellen Thompson, Miss Casselbohm, Miss Nellie McLaughlin, Miss Bromley, Miss A. Campbell; Recording Secretary, Miss Nellie Owens; Financial Secretary, Geo. Wade; Treasurer, Miss Jean Parker. At the recent picnic at Woodward's Gardens in aid of this organization, the net receipts amounted to nearly $1,700.

SAN JOSE is planning for a $15,000 school house.

SAN JOSE.—From the last report of the City Superintendent we compile the following statistics: Whole number of boys enrolled, 1,005; whole number of girls enrolled, 975; total number enrolled, 1,980—an increase in general enrollment of 291 pupils over last year. The average number belonging, 1,267; average daily attendance, 1,169; number of census children, white, boys 1,144, girls, 1,309, total, 2,453; negro, boys 17, girls, 20, total, 37; Indian children who live under guardianship of white persons, 3 boys. Total number of census children 2,493; last year, 1,945; increase 548. Number of children between five and seventeen years of age who have attended public schools at any time during the school year—white, 1,441; negro, 17; total, 1,458. Number of children between five and seventeen years of age who have attended private schools, but no public school, at any time during the year—white, 441. Number between five and seventeen years of age who have not attended school at any time during the year—white, 593; negro, 1; total, 594. Number of Mongolian children under seventeen years of age, 35. Number of Mongolian children between five and seventeen years of age attending school, 16. Total receipts from all sources, $59,872 80. Total current expenses, $35,173 48. Average cost of each scholar, per school year, $24 30. The average number of pupils belonging to the colored school is 15. The expenses per month is about $110, making the cost for each colored scholar $73 33⅓ per year. Number of high schools, 1; nnmber of grammar schools, 1; number of primary schools, 4; colored schools, 1; training schools, 1. Total number of schools, 8. Number of male teachers, 5; number of female teachers (including music teacher), 25. Total number, 30. Increase of 4 teachers over last year. Of teachers, holders of Life Diplomas, there are 3; of State Educational Diplomas, 3; First Grade Certificates, 14; Second Grade Certificates, 7; Third Grade Certificates, 3. Monthly wages paid teachers: one at $150, one at $125, one at $100, two at $90, fifteen at $80, five at $75, five at $70. Average wages paid male teachers, 107; average wages paid female teachers, $78. Value of school library, $1,200; number of volumes in school library, 1,000. Value of school lots, houses and furniture, $83,300; number of certificates granted, 20; number of High School graduates, 19.

NORMAL SCHOOL BUILDING.—The work on the State Normal School building is progressing rapidly. About twenty-five men are now employed, including carpenters, plasterers, painters and lathers, and work is being carried on in all parts of the structure. The appropriation of $25,000, made by the last Legislature, will not be exhausted for more than a month yet, but just how the remainder will be expended is to be determined by the Commissioners. They are making estimates of the cost of the work in the different parts of the building, with a view to expending the greater amount where it is most needed. Much has been done since work commenced this season. The first floor is all completed, with the exception of some graining on a few of the doors. The work has been finished up in the finest style, the graining, by Kennedy, Brown & Jarman, being unsurpassed. On the second floor the plastering has been done, the casings and wainscoting put up, and the doors and shutters hung, besides some painting. The rooms will all be plastered, except those in the attic. Carpenters are now busy fitting up the exhibition hall, and the foreman expects to have it completed before the appropriation gives out. The seats are being put in the gallery, and a large and magnificent arch is being constructed across the rostrum. When finished, this will be one of the finest exhibition halls in the State. It is thought the painters will be at work for nearly two months yet.—*San Jose Mercury.*

THE Yolo *Mail* understands that the colored people of that District have made an attempt to punish the Trustees for non-performance of past duties with regard to supplying them with facilities for the education of their children. The action they have taken leads some to think that they insist on being admitted to the school in connection with white children.

WE learn from the *Democrat* that a new addition to the school house at Santa Rosa is to be built which will cost $8,000. When completed the building will be 62 feet front by 136 feet deep, and two stories high. There will be twelve rooms in all, and the building will accommodate 500 pupils.

THERE is only accommodation for about nine hundred children in the Los Angeles public school houses, while there are at least two thousand children whose wants must be provided for if the compulsory law goes into effect.

AT a recent examination in Stockton of applicants for teachers' certificates, one of them defined electricity as "a liquid bottled up and hauled out with a wire when required for use."

MRS. CANNY, Mrs. Bush and Mrs. Berry have been appointed as School Trustees for the ensuing term in Willow Glen School District in Santa Clara.

IN Vallejo the colored children have been admitted into the public schools on terms of perfect equality with the whites, with very little opposition.

BOOK NOTICES.

A MANUAL OF MEDIÆVAL AND MODERN HISTORY. By M. E. Thalheimer. Cincinnati and New York: Wilson, Hinkle & Co. Price, $2 50.

This is a companion book to Miss Thalheimer's well and favorably known "Ancient History," and worthily sustains the author's reputation of writing the most serviceable histories within the reach of our schools.

The volume contains a sketch of fourteen centuries, from the fall of the Western Empire at Parma, A. D. 476, to the establishment of the German Empire, A. D. 1871. This vast mass of matter is presented not in a series of separate histories, but in a comprehensive view of the civil history of Europe and its dependencies. This object is reached not by a bare and compendious statement of facts, and generalizations of interest only to the mature reader, but by a simple yet full and interesting narration of events.

As in "Ancient History," the geography is a valuable feature of the book, and much better than is usual in American school histories. The twelve maps presented are from Spruner's new Historical Atlas. The whole arrangement of the book is such as to greatly facilitate and simplify a study which is almost totally neglected in our schools, and which yet should precede or at least be contemporaneous with the study of American history. Without some knowledge of European history, ancient, mediæval and modern, the study of American history must be unintelligible in many respects, and some of its most valuable lessons will be totally lost. If no further use can be made of this volume in our common schools, teachers should at least familiarize themselves with it, in order to qualify themselves to give those connecting links between European and American history which form such important elements in the rise and organization of American civilization, and which even now intimately affect our country. Something like this is absolutely necessary to give pupils a thorough understanding of our national institutions, and to rescue them from that deplorable ignorance of contemporaneous history which is so common.

The fine and heavy paper, the clear and correct typography, make the book as handsome a school-book as has been published.

TWELVE LECTURES ON THE THEORY OF PEDAGOGY. Delivered before the Cincinnati Teachers' Association. By W. N. Hailman. Cincinnati and New York: Wilson, Hinkle & Co. Price, 75 cents.

These Lectures do not present an abbreviated history of pedagogy. They simply sketch, in a concise form, the gradual growth of the leading principles of

modern education, singling out for this purpose a few of the most prominent thinkers and workers in the field of pedagogy.

The need of books on the history of pedagogy we pointed out some months ago in noticing Quick's *Essays on Educational Reformers*. Mr. Hailman's book is a less elaborate treatise on the same subject, and is therefore, perhaps, of more value as an introduction to the study of pedagogy. For in laying almost exclusive stress upon the most important principles that should underlie all education, it presents the essential spirit of the subjects under consideration, and does not encumber the history of pedagogy with those less important or even useless details and facts which while necessary to an exhaustive history of pedagogy, are yet apt to mislead the beginner.

May the little work be fruitful of good results, and contribute towards developing that character, intelligence and individuality in teachers, which alone will induce the growth of correct principles in the profession.

THE AMATEUR ACTOR. A collection of plays for school and home. By W. H. Venable. Cincinnati and New York: Wilson, Hinkle & Co. Price, $1 50.

This volume gives twenty-three dramatic pieces, most of them taken from standard authors. Most of them are of easy representation as school or parlor plays, but some of them are far beyond the capacities, dramatic and scenic, of school and home. As in the case of the "School Stage," by the same author, noticed in the February TEACHER, every piece is accompanied by stage directions and description of costumes. The introduction to the book contains plain and full directions for making all necessary preparations to insure the success of the plays. The book will be welcomed by all who are interested in school and home amusements.

PROGRESSIVE AND PRACTICAL METHOD FOR THE STUDY OF THE FRENCH LANGUAGE. By F. Duffet. Part Second. Cincinnati and New York: Wilson, Hinkle & Co. Price, $1 00.

The first part of this new French Grammar was noticed in the May number of the TEACHER. The favorable opinion then expressed regarding the work, is fully confirmed by the book before us. One of the most valuable features of the work is the introduction of conversation in place of the disjointed and frequently nonsensical exercises which form the staple of the usual grammars. The practicability of M. Duffet's method is shown in the construction of the lessons, which contain, 1st. A vocabulary of about sixteen words in common use, a ranged according to subjects; 2. Practical rules and idioms; 3. A number of sentences illustrating the application of the vocabulary, rules and idioms; 4. An exercise in French conversation, which the author considers of great importance as a means of training the ear and assisting in the practical study of the language; 5. An exercise (a theme) on the application of the different parts of each individual lesso ; 6. And, finally, one or more anecdotes, letters or other subjects, which also serve as exercises. In the words of the author, "whoever studies and makes himself thoroughly familiar with this Method, will acquire a practical knowledge of French, and a considerable facility in writing and speaking the language." A Key to this Method is a desideratum to students studying without a master, and we hope that author and publishers will supply it.

INDEPENDENT CHILD'S SPELLER. Printed in imitation of writing; with original classification of words, formation of columns, and exercises for reading, writing, etc. By J. Madison Watson. New York and Chicago: A. S. Barnes & Co. Price, 35 cents.

This volume differs from the one noticed in the TEACHER for January, 1873, only in having a "Slate Attachment." The peculiar advantages of this new feature are that it enables teachers to note memoranda, daily records, etc., and pupils to write their lessons, etc., without having recourse to anything but the book itself. We commend this new feature, knowing that it will be of considerable value in the school-room.

ST. NICHOLAS FOR SEPTEMBER

Well sustains the leading position this Juvenile has taken not only in this country, but even in England. History, Natural Philosophy, Literature, Fine Arts and Manufactures are presented to young readers in an attractive way, and children are not only amused and instructed for the moment, but are stimulated to seek further information for themselves. The influence in school and at the fireside, of a periodical like *St. Nicholas* can hardly be estimated, and certainly not be overrated. The monthly advent of "St. Nicholas," and the new life and interest it will infuse into the school-work, ought to be secured for every school. $3 00 can easily be collected for this purpose. Scribner & Co., New York, Publishers.

THE INTERNATIONAL REVIEW. July—August, and September—October. New York: A. S. Barnes & Co. Price, $5 00 a year.

A glance at the contents of these numbers shows that the promises of the publishers in beginning the enterprise have been fully observed. The articles appearing in these two numbers are:

Wm. Cullen Bryant and his Writings, Ray Palmer, D. D.; Coal and its Supply, Prof. E. B. Andrews, State Geologist of Ohio; Thirteen Years of Freedom in Italy, Prof. Angelo Gubernatis, L. L. D., Florence, Italy; The Catholic Reformation in Switzerland; The New Revision of the English Bible, Prof. Geo. P. Fisher, D. D., Yale College; The Orthodox Greek Church, the Princess Dora d'Istria; The Negroes in the Gulf States, E. T. Winkler, D. D., Georgia; Leonardo da Vinci and his Works, Prof. Geo. L. Austin, Cambridge, Mass.; Ariston, A. Tragedy; The Moral Condition of France in 1874, E. de Pressensé, D. D., National Assembly; The Constitution of the Sun, Prof. C. A. Young, Dartmouth College; Charles Sumner and International Peace, G. F. Magoun, D. D., Pres't Iowa College.

THE CHRISTIAN UNION

Continues weighted with good things, religious and secular.

THE SANITARIAN

For August gives unusual prominence to questions which are of interest to the lay readers and the public in general. "Concentration and Sanitary Regulation of the Business of Slaughtering in Cities," "Mental Culture," "Do you Live over the Shop," "What Alcohol will Do," and quite a number of other articles make up the contents of this number.

LITTELL'S LIVING AGE

Proves more and more indispensable to that large class of readers who are dependent upon eclectics in keeping abreast of the best thought and literature of the age.

OUR FIRST HUNDRED YEARS; the Life of the Republic of the United States of America. By C. Edwards Lester. Published in twelve Monthly Parts, to be completed July, 1875. United States Publishing Company, New York.

The first two parts of this work are before us. They treat of the First Period, Discovery and Colonization. We have not the requisite time this month to carefully examine the work. We shall do so, however, as soon as some further numbers have been received, so that we may be able to judge more fully of the author's capacity for the task he has undertaken. The parts are published at 50 cents each.

GRADED SINGERS FOR DAY-SCHOOLS.

By O. BLACKMAN and E. E. WHITTEMORE.

"In Chicago, musical instruction in the schools is far more intelligent and systematic."—APPLETON'S JOURNAL.

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No. 1 is intended to commence the study of singing in the Primary Department. In the Chicago Schools it carries the pupil through the lower four grades, occupying about three years of time.

No. 2 is complete in itself, and is adapted to Intermediate and District Schools, whether graded or not. Also well adapted to Female Seminaries, etc.

No. 3, being a beautiful collection of music, arranged in three parts, is also adapted to the wants of Female Seminaries.

No. 4 is intended for High Schools and all adult classes of mixed voices when the four parts are combined. A useful chorus-book, containing selections from the masters, and many pieces suitable for closing exercises, concerts, etc.

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E. P. HEALD, *Pres't Business College, San Francisco.*

CALIFORNIA
STATE NORMAL SCHOOL.

LOCATED AT SAN JOSE.

Calendar—1874-5.

FIRST TERM.

Opens Wednesday, June 10th, and closes October 23d, 1874.
Fall vacation, from October 24th to November 2d, inclusive.

SECOND TERM.

Opens Wednesday, November 4th, 1874, and closes March 25th, 1875.
Christmas vacation, from December 23d to January 4th, inclusive.

PROGRAMME FOR CLOSING WEEK.

Final examinations, Monday, Tuesday, and Wednesday.
Lecture before literary societies, Wednesday evening.
Graduating exercises, Thursday, 2 o'clock, P. M.
Alumni Association, literary exercises, Thursday evening.

CONDITIONS OF ADMISSION.

For admission to the Junior Class, the following qualifications are requisite:

1. *Age.*—If ladies, sixteen; if gentlemen, seventeen years.

2. *Certificates.*—A valid Certificate, State or County, of any grade.

3. *Examinations.*—A limited number, for the present, may be admitted on examination. They must present certificates of good moral character, and pass an examination such as would be required to obtain a Third Grade Certificate.

For admission to the Senior Class, pupils must present a valid Certificate, and pass an examination upon the studies in the Junior year.

None are admitted to the Senior Class under seventeen years of age.

Pupils may be admitted to the Junior Class at any time during the year, but all applicants for admission to the Senior Class should present themselves at the beginning of the year, as none are graduated who have not been one year in attendance in the school. This is necessary in order to receive the necessary instruction in Methods of Teaching.

Those who are unable to pass the preliminary examination for admission to the Normal School, can enter the Preparatory Class, until qualified.

For further particulars, apply for Catalogues or information, to

CHAS. H. ALLEN, Principal.

THE

CALIFORNIA TEACHER.

OCTOBER, 1874.

VOL. XII. SACRAMENTO. No. 4

[*For the California Teacher.*]

BOTANY FOR SCHOOLS.

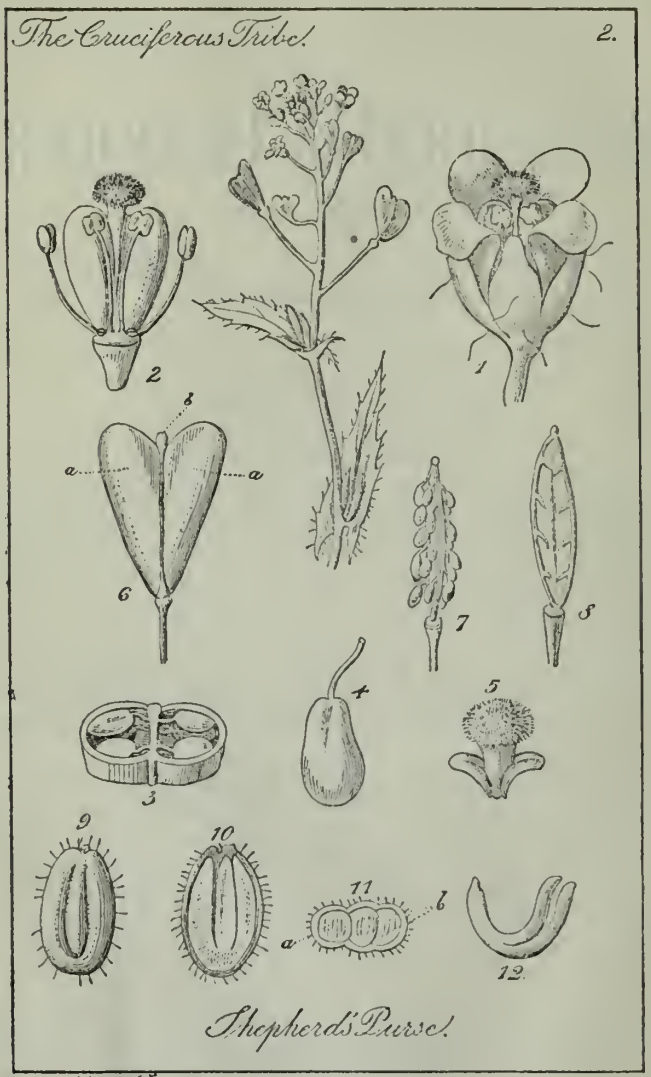
II. THE CRUCIFEROUS FAMILY.

The healthy, stimulating effects of Mustard and Cress, and the nutritive properties of Turnips and Cabbages, are well known to everybody. These plants belong to an extensive tribe called Cruciferous or Cross-bearers, because their four petals are placed in such a way as to resemble, in some degree, a Maltese cross.

Many of my readers are already, I suspect, familiar with a mean-looking weed called Shepherd's Purse (*Capsella bursa pastoris*), which is found everywhere, at all seasons of the year.

The flowers are arranged regularly upon a central stalk in the form of a *racenee;* and, what is extremely singular, they are uniformly destitute of bracts. This is so unusual a case that I do not remember any other instance in the whole vegetable kingdom in which bracts are so constantly absent; the absence of these little leaves (bracts) is hence a mark of the Cruciferous family.

But it is not thus alone that Cruciferous plants may be recognized. The structure of their flower is of a very peculiar kind. The calyx is formed of four little leaves or sepals, within which are four very small white petals, arranged in the manner already stated; hence, the appellation of Cross-


The Cruciferous Tribe.
2.
1
2
3
a
a
6
7
8
4
5
3
9
10
11
a
b
12
Shepherd's Purse.

bearers (fig. 1). Within the petals are six stamens (fig. 2), of which two are a very little shorter and more spreading than the other four. To this character no parallel is to be found in any other than Cruciferous plants, and consequently it is a second essential character by which they are to be known.

The pistil is an oval green body, shaped something like a wedge, on the summit of which is a little cushion or stigma, seated on an exceedingly short style (fig. 2). If you cut open the ovary you will find (fig. 3) that it contains two cells, in each of which are a number of young seeds or ovules, hanging by slender, thread-like stalks.

The fruit (fig. 6) becomes a wedge-shaped, flat body, composed of three pieces, two of which (fig. 6, *a. a.*) the valves, separate from the third (fig. 6, *b.*), which is named the *partition* or *dissepiment* (fig. 8); it is to the edges of this third piece that the seeds stick by little threads (fig. 7). In the inside of these seeds the embryo is bent double, after a singular fashion (fig. 10), the seed-root being pressed close to the back of the seed-leaves.

This has been rather a wearisome lesson; but you have now the satisfaction of knowing that you possess the secret of recognizing with certainty nearly a thousand species, scattered over the face of the world, all of which are harmless, and many highly useful.

What would the farmer do without turnips and rape, or the gardener without cabbages, sea-kale, mustard, cress and radishes; or the florist without wall-flowers, stocks and candytuft?—all Cruciferous plants? All these are such common plants that you have no difficulty in procuring specimens for examination; you will find that while they are all unlike in trifling circumstances, they agree in having their parts arranged exactly in the same manner as in the Shepherd's Purse; but you will remark a difference in their fruit, of this nature: in some of them, as in the Shepherd's Purse itself, the pod is so very short that there is not much difference between its length and breadth; in others it is very long and slender, as in the turnip and cabbage.

Any one of the following plants, so very common in our gardens or fields, may be selected instead of the Shepherd's Perus: Candytuft (Iberis), Sweet Alyssum, Wallflower (*Chei-*

ranthus Cheiri), Marsh-Cress (*Nasturtium palustre*), Winter-Cress (*Barbarea vulgaris*), Western Wallflower (*Erysimum asperum*), Peppergrass (*Lepidium*).

In conclusion, I request again the reader not to study these articles on Botany without specimens in hand, for without them it is wasting time.

MANUAL OF INSTRUCTIONS REGARDING THE COURSE OF STUDIES.

§ 5. SPELLING.

The ultimate object of all spelling exercises is to train pupils to write words with the proper letters, according to common usage. As is well known, the words employed by a writer are dependent upon the nature and extent of the writer's mental culture. The mental culture of a person will therefore determine the words he uses in writing, and his art of spelling should be co-extensive with his vocabulary. The usual method has been to present to the learner a vocabulary of the words which occur or may occur in daily use, in conversation, in newspapers and in current literature, including popular science. This vocabulary is arranged, not according to the learner's mental development as represented by the words he will most naturally employ at every stage, but according to the length of the words, their derivation and classification. Naturally enough, therefore, the name of a thing is frequently presented long before the idea of the thing is presented to the learner. The spelling-book, or speller, as it is usually called, aims to anticipate the words whose meaning the learner may learn in his school-course or in after life; and it is assumed that if the learner can store away in his mind the spelling of these words he is fully equipped in one of the first requisites of composition—good spelling. Unfortunately, this is contrary to all mental laws, and hence it obstructs all mental development, and is subvertive of the very object aimed at. Spelling isolated words, as they are usually arranged and grouped in spelling-books, is a mere waste of time. It has a tendency to accustom pupils to use words, or read words without associating a meaning with

them; for isolated words awaken and produce no ideas; and, because they do not, pupils have no use for them, are not interested in them. Being mere empty, meaningless signs, they are speedily eliminated, rejected, and forgotten. "In Scotland," says Horace Mann, "the spelling-book is called the 'spell book,' and we ought to adopt that appellation here, for, as it is often used with us, it does cast a spell over the faculties of children, which generally they do not break for years, and oftentimes, we believe, never. If any two things on earth should be put together, and kept together, one would suppose that it should be the idea of a thing and the name of a thing. The spelling-book, however, is a most artful and elaborate contrivance, by which words are separated from their meanings, so that the words can be transferred into the mind of the pupil, without permitting any glimmer of their meaning to accompany them. A spelling-book is a collection of things without the thing signified—of words without sense—a dictionary without definitions. It is a place where words are shut up and impounded so that their signification can not get at them; yet formerly it was the almost universal practice—and we fear it is now nearly so—to keep children two or three years in the spelling-book, where the mind's eye is averted from the object, qualities, and relation of things, and fastened upon a few words, of themselves wholly uninteresting."

Various have been the methods to avoid the evils attendant upon the use of spellers. Pupils have been required to give the definitions of the words they were required to spell. This the pupils were able to do by the help of the dictionary. It was soon found, however, that pupils could just as well repeat definitions without attaching any meaning to them, as they would spell words without attaching any ideas to them. The next step was to require pupils to incorporate the words in sentences. If the word was within the comprehension of the pupil, little difficulty was met with; but as soon as the word was beyond the pupil's understanding, sentences were either copied from the dictionary, or non-sense was the result.

The lamentable deficiency of pupils in spelling has been deplored *ad nauseum*. That this deficiency may be ascribed, in part, to the construction of the English language, cannot be doubted. But, on the other hand, the manner of presenting the

words to be spelled is the primary cause of poor spelling. A child, like a grown-up man, will, in writing, use only such words as it has assimilated, partially at least. In other words, the vocabulary of a child is co-extensive, in a general way, with its mental development. The mental development of a child is dependent upon the studies it is pursuing; and the words occuring in the child's reading lessons, geography lessons, etc., will be the words of which it can obtain a more or less complete understanding. These words are not necessarily shorter or longer, derivative or primitive, Anglo-Saxon or Latin, according to the child's advancement. They are simply words, no matter what their length, composition or derivation, which the child may be assumed to understand, and which it may use in writing. These are the words, then, which form the proper material for the child's spelling lessons.

Take now these same words, and isolate them, and group them in spellers, and they may still have no meaning to the child. To understand a word, to fully grasp its meaning, it is frequently necessary that the child views the word in its relation to other words, in short, in its office as part of a thought. How true this is even in maturer and more disciplined minds, may be inferred from the necessity our lexicographers are under to illustrate the meanings of words by means of examples, that is, by means of sentences and passages in which the word occurs. Mere definitions would be of no value in the majority of cases. Hence for a child to understand a word, it is necessary, first, that the word be within its understanding; and second, that the word be not presented isolated, but in relation, that is, as forming a part of a sentence or thought.

Taking as granted that a child should be required to spell only words to which it attaches an idea, it will be seen from the above that in the majority of cases a child should spell a word only as it occurs in the reading lesson, or in some other lesson; that is as the word is seen in its office as part of a thought. These considerations will show the necessity of discarding spellers, and upon depending upon the general lessons and exercises for the spelling lessons.

Spelling depends, first, upon the knowledge of the letters composing a word; and second, upon the ability to write these letters in their proper order. That the second is not a necessary

result of the first must be known by all who have taught. A child may be able to spell a word orally, and yet make even gross errors in writing the word immediately afterwards. It takes years of practice to enable a child to write every word just as it knows it should be spelled. First, the eye must become fitted to perceive with accuracy words in their printed or written forms, and the ear must with equal accuracy learn to hear aright. Secondly, the pen must execute what the eye and ear perceive. Herein lies the whole secret of orthography.

In this manner, we learn the spelling of technical words, or words occurring only in special studies. In this manner, foreigners learn English spelling, and this is the only logical manner for children to learn spelling. This method will insure not only correct orthography, but it will also insure a more thorough studying and more complete understanding of the several lessons.

It will be seen from the above, that written spelling is the principal method of teaching correct orthography. From what we have said about the necessity of showing the word in its office as part of a thought, it will also be clear that dictation exercises of isolated words are not as valuable as the writing at dictation of whole paragraphs of the lessons, or of sentences unlike those found in the book. Copying the different lessons is a useful and indispensable exercise. The words tabulated at the head of the reading lesson, words in common use, the new words occurring in object lessons, geography, and other lessons, should be neatly written by the pupils on their slates and on the blackboard; and the more difficult words should be written in columns on the blackboard, and frequently read and reviewed. But the first requisite in all these exercises is that the pupil be never allowed to write by himself. The teacher must so appoint the length and time of his exercises that he can carefully scrutinize every slate. Nothing must be allowed to be written without exact correction. Inattention to this will soon make the pupil incorrect by familiarity with his own errors. Misspelled words should be given to the pupil or the class at the next exercise; and it is best that the misspelled word be re-written correctly, and in such a position that the false and true spelling may be seen at a glance.

If by this method even only one page a week be copied and

written at dictation, the pupil will have advanced farther in orthography than by spelling a dozen columns of the speller.

Oral spelling is not to be discarded altogether, it is simply to be relegated to the subordinate position occupied by it in practical life. Frequent occasions will be found for oral exercises; and such occasions must be fully made use of. At the close of every reading lesson, the words at the head of the lesson, and such words as the teacher may select from the body of the lesson, should be spelt orally. It must be remembered that the minimum requirement for each division or grade, is the ability to spell orally, or write at dictation any word or paragraph of the reading lesson, and the technical words used in the several branches taught.

As soon as the advancement of the pupil will allow, the most general rules of spelling and etymology should be learned and constantly applied. A knowledge of the most common prefixes and suffixes—so indispensable to accurate and intelligent spelling—can be easily acquired by any pupil reading in the second or third reader. Care must be taken, however, not to enter too soon upon word analysis proper. A child may easily learn that *dis*, *un*, etc., mean *not;* and it may be able to analyze dislike into *not* and *like;* but it will require a pupil far more advanced to enter upon the study of the roots of words.

§ 6. INSTRUCTION IN LANGUAGE.

Under this head we include instruction both in grammar and in composition. These branches of study are generally made too technical, and the result is a skill in the enunciation of rules, and an utter ignoring of those very rules in speaking and writing. The use of good and correct language is the result more of habit than of technical study. Hence "every exercise of the school-room, in which words are either spoken or written, should be made an exercise in the use of language." "Great attention," says Hon. J. G. McMynn, "should be given to the language used in the schoolroom, both by teachers and pupils. It should be pure English, free from all provincialisms; and the construction of the sentence should be grammatical. It is of the utmost importance that the teachers of our primary schools should be accurate in the use of language; quick to notice, and prompt to correct all 'bad grammar'

heard in their school-rooms. No *slang*, no undue expletives, no unnecessary repetition, no obsolete words, no violation of Orthography or Syntax should, at *any time*, or under any circumstances, be allowed to pass without careful correction. The power of expression may be cultivated by 'Object Lessons' and conversation. Pupils should also be advised and required to write much. Recitations may sometimes be conducted by writing, and will be found profitable. Questions should be pointed and precise; answers should be concise and exact. Every answer should embrace a complete proposition. Frequently the pupil gives the answer only in part. Every exercise, and every recitation, should be so conducted as to habituate the scholars to correct, terse, and elegant modes of expression. All indistinctness of utterance, all clipping of words, all hesitancy of speech, should at once be noticed, and the proper remedies faithfully applied."

The technical study of grammar and composition must be based upon the reading lessons. The reason for this will be plain from a careful consideration of the following extracts from an article on the "Fundamental Principles of Teaching Language," published in the TEACHER for May, June and July, 1873.

"The written language is, for the scholar, something different from the language of ordinary conversation, and even in this latter he is not perfectly accomplished. How then is the child to be expected to put his thoughts on paper in written language before the genius of the language has, to a certain degree, ripened within him, before he has acquired a knowledge of the most important rules of Grammar? The child must necessarily commit errors in style, and the worst of it is, he has no idea that what he has written can be faulty. He is capable neither of *understanding* nor of *feeling* his errors. Thus his very exercises in expressing his thoughts in language become the means of corrupting, of preventing, his sense of the genius of the language, its spirit, its feeling.

"Above all things else the genius of the language studied is to be cultivated; this, it is easy to see, is not attained by the literary efforts of the scholar, but by choice selections for reading. Therefore, in order to cultivate in the learner the genius, the spirit of the language, I am most thoroughly in favor of assiduous and frequent contemplation, perusal, discussion, copying, and committing to memory of good selections, and as thoroughly opposed to premature, unaided writing of the lan-

guage studied. Whoever confines himself in the lower classes to this, will, in the higher classes, have reason to rejoice at the result. But let us ask what is the aim of early, unaided, written exercises? In orthography and manner of expressing one's self surely nothing is gained, but much may be corrupted. Is it for the purpose of forcing children to think? Let us not forget that the effort of the child to think for himself and by himself, is often not worth a penny; and, at the most, exercises of this kind are merely a mechanical effort, the occasion for the exercise of the memory. The teacher who thinks, will, in his teachings in the school-room, sufficiently incite thought in his pupil.

"*Instruction in language is to be associated with selections for reading.*—The aim of instruction in language is not to add to the knowledge (historical, geographical, or other) of the pupil; just as little has it for aim to exercise the power of thought. Certainly, instruction in language will be, should be, and must be an exercise of the thinking powers, but this is not its *aim*. Such instruction is rather mutual action, reciprocal effect of thought and speech. For this reason the so-called 'exercises in thinking' can be advantageously combined with the teaching of language, and vice versa; at least they may mutually aid each other.

"The aim of instruction in language is this:

"*First*—To make the language of literature, or, what should be the same thing, of cultivated people, intelligible to the pupil.

"*Second*—To render the pupil capable of expressing himself in the language studied.

"Without the first, the second is not possible; let the first be attained and the second comes of itself.

"If the real purpose of instruction in language is expressed in the above words, then the first and indispensable means thereto is the speaking in a cultivated style to the pupils, and the reading to them of select literature from books. Such means will effect more than all other means together.

"But that this method should have its full influence, instruction in language has, for its task, to guide the learner and to accustom him not merely to the intelligent comprehension of *thoughts* spoken, written or printed, but also to the *manner* in which those thoughts are *expressed*. But this guiding and this familiarizing of the learner, is less easily effected by means of what is spoken than by means of what is done; that is of what lies printed or written before the pupil, whereby, at the same time, the receptive power of the mind is aided by a second sense, that of the eye. For example: is it not quite another thing when the scholar sees before him the changes in the declension of a word, from what it is when he has to find out, merely by the ear, what changes the word undergoes? Hence the knitting on, if we may use the expression, of the instruc-

tion given in language to some piece selected for reading, is far preferable to every other art and manner of teaching.

"Here the ground-work is laid on which the teaching of grammar is to be built up, and hereby the pupil learns to feel those forms of speech, and the relations of the different parts of a sentence to each other, which it is the province of grammar to elucidate. From the language itself the child learns to discover the rules of the language, and this is exactly as it should be. In the old method of teaching language it would never occur to the child in reading to think of the structure of a sentence, of its separate parts, its principal words, etc. In the new method the child will and must learn early to think of these things, because, in exercises of expression, he has become familiar with them. What an advance in the linguistic career of the scholar!

"Let it not be understood that in the teaching of language the reading of detached, though complete, sentences is sufficient, but the reading must be of selections taken as a whole, finished in themselves, in style and in thought.

"Taken in a wide sense, the teaching of language in our schools has for its purpose to regulate, correct and enlarge the pupil's sphere of thought; to practice him in the certain and quick comprehension of what he reads and hears, and in the clear and correct expression of his own thoughts and of the thoughts of others. This purpose is accomplished principally by means of varied exercises, and by cultivating the feeling of the genius of the language. Thus our teaching of language aims at making the language of eloquent discourse and literature intelligible to the pupil."

In speaking of reading (see TEACHER for September, 1874, page 92, *et seq.*), we explained the composition of a complete reading lesson, and gave also the requisites for correct and good reading. The conditions there given being fulfilled, and the requirements satisfied, the foundation is laid to enable the pupil to express himself in grammatical, refined and elegant language. The means are thus indicated which are to be used by the teacher in order to accomplish the purpose of instruction in language. By the application of these means more will be gained in enabling learners to understand and use written language than by all other methods heretofore in use. Let us now designate the main points in the plan of teaching language; these, however, need not necessarily be considered in the following order:

"This instruction is to be given conjointly with a reading-lesson. The reason why is found in the foregoing. But it is

not meant by this that *all* oral instruction or discussion in regard to language, not connected with a reading-lesson, is to be avoided. On the contrary, such separate discourse is often advisable." To connect in the most profitable manner, instruction in language with object lessons especially, it is a prerequisite that such lessons be conducted as indicated in the concluding paragraphs of our article on *Mental Discipline.* (See TEACHER for September, page 92.)

The manner of reading, explaining and analyzing the reading lesson was pointed out last month, page 93. For the sake of perspicuity, however, we repeat what we said there:

"1. The reading lesson is to be read by teacher and by pupils in conformity with the requirements given on page 93, and when too long or when the ability of the pupils is insufficient, then, by questioning, let it be drawn out by sections or paragraphs from the pupils themselves, or, where possible, let them repeat it by sections.

"2. Unintelligible or obscure expressions which, in reading, questioning, and recitation, have been brought to the notice of the teacher, are to be explained to the pupils and erroneous ideas corrected.

"3. The reading lesson is to be considered in its separate sections—that is, the principal or larger groups are to be noticed.

"4. The different thoughts contained in the separate sections or larger groups of thoughts, are to be so brought out that the learner becomes aware of them. By mere reading these thoughts pass in too quick succession through the child's mind, so that, often, the child does not know what he has read.

"5. The particular manner of utterance or expression of these separate thoughts is remarked upon, also the reference or relation of these thoughts to each other, and herewith we enter upon the proper and peculiar sphere of instruction in language. Here the attention is to be fixed upon the separate sentences of the reading-lesson, and the pupils must learn to perceive the signification of the phrases and separate parts of the sentence, their relation to the complete sentence and the ideas and forms of words, etc., thus introduced. Still further, this will lead us to notice classes and families of words, separate words, and the manner of writing them. In this treatment of Instruction in Language in its essential characteristics, we would offer to consideration the following points confirmed by our own experience:

"1. Not to dwell too long upon the reading of one and the same piece. In general but few lessons are to be given to one selection. Otherwise, besides the danger of losing the interest of the pupil, we also fail of our aim in bringing before the young

mind many and varied forms and structures of language—language-pictures—and neglect many other things already mentioned. What one is thus obliged to omit in regard to one piece selected for reading, can be introduced in regard to future ones.

"2. In this method of linking instruction in language to a reading lesson, it is necessary to keep to some systematic order of gradual progress. By this I mean that the teacher is not to lay hold indiscriminately of some reading lesson and then speak promiscuously of grammar, orthography, etc.; but that, having fixed upon the subject matter to be taught and arranged it in the form of a successive series, he shall, in connection with this selection for reading, take up one or more of these themes according to their order. Whatever is introduced that is new to the scholar, must be held before him until he has obtained a conscious knowledge of it, although it may not be possible to dwell upon it till it becomes fixed in his mind. Hence the advancement made is but slow. If necessary, one and the same theme may be made the subject of several selections for reading. When the whole series, or a greater part of it, has been concluded, then make a summary review.

"3. What has already been treated of is to be renewed and fixed in the mind of the learner by continual repetition. This can be done, in part, in reading-lessons in which something new is to be developed, and, partly, in reading-lessons selected at pleasure, solely for the purpose of review.

"4. Minor items, for example, that an interrogation point is placed after a direct question, that the name of a person is always commenced with a capital letter, as, also, the particular place in which he resides, etc., may be introduced at pleasure, wherever the reading lesson offers opportunity.

"5. It is not necessary, in the discussion of a reading-lesson, studiously to exclude all and everything which according to the teacher's plan should be fully treated of only at a later period. If an especially appropriate opportunity offers, or if it is necessary to the understanding of anything, then, so far as needed, let the teacher make previous mention of these things.

"6. Oral instruction is to be aided by written exercises. Of this it is necessary to speak more fully. The need of such written exercises rests not merely on the desire to fill up certain school hours, or to give suitable employment to the child at home, but also on the fact that in oral exercises the minds of the scholars of the class are not all equally active, that we cannot take so especial a hold of the thought of each as in written exercises. As a rule, in oral questioning, only the one to whom the question is addressed becomes fully active in thought, while with a large part of the remaining scholars who are interested to a greater or less degree, the attention paid is, at least, less spontaneous. In written exercises, on the contrary, every

scholar must give his full attention and turn his whole mental power to the subject before him.

"To obtain, in oral exercises, from each pupil the same degree of spontaneous activity which is aroused by written exercises, would involve a greater expenditure of time than a teacher can usually afford. The teacher would never have time enough to convince himself whether each separate scholar had fully comprehended the subject spoken of, or to what degree he had comprehended it. Thus, for this reason too, are written exercises necessary, if the teacher does not wish to go on building up a structure without knowing beforehand that a sure foundation has been laid by each of his pupils. The examination of these written tasks will first render it possible for him to gain a correct knowledge of the result, in each of his pupils, of his teaching, while, at the same time, it will serve as a necessary guide for subsequent oral instruction; such knowledge is, moreover, indispensable to every teacher who does not desire to beget in his pupils a knowledge that is broken, disjointed, unconnected, and often erroneous. But granted that the teacher has sufficient time for such oral exercises, he would hardly avoid a certain sense of tediousness which enters with the diminution of mental activity in a majority of the pupils. It would be chiefly among the most ready and capable scholars that a condition of restlessness and uneasiness would arise as soon as the teacher should be forced (an unavoidable circumstance) to busy himself with those naturally more dull. Nothing is more dangerous to the child's interest in learning, and also for discipline, than this sense of tediousness and the uneasiness and discomfort proceeding from it. Hence oral exercises must often be interrupted at a point when, for a larger or smaller part of the pupils, it is necessary to continue them. This continuation constitutes the written exercises which again force the more capable scholars to spontaneous activity.

"The result of all this is the necessity of written exercises demanded by instruction in language in its different branches; and, from these points of view, instruction in language in its treatment of each of its different subjects, divides itself into three departments. These are: First—Awakening of the intellect. Second—Oral exercises. Third—Written exercises.

"The question as to what constitutes the special province of these written exercises, is easily answered by pointing out that they should be nothing else than a continuation of the oral exercises. One must also know what oral exercises are to be linked to every rule of orthography, grammar, or rhetoric which has come under discussion with the pupils. Since, however, all oral instruction cannot be adapted to written exercises, many because requiring too much assistance from the teacher, others because too lengthy for written recital, or because beyond the orthographic skill of the pupils, a selection

must be made suited to conditions, and what is to be required stated somewhat in this form: All oral exercises must also be prepared in written form, so soon as this form does not exceed the capacity of the pupils. The more nicely graduated the steps of the course, from easier to more difficult, which the teacher follows in these exercises, so much greater the number of exercises possible."

JOHNNY CONTINUES HIS STUDY OF EYES.

By Adam Stwin.

The day fixed for the visit to Central Park proved charmingly pleasant: not too warm, yet sunshiny enough to make the contrasts of light and shade all that were needed for Johnny's purpose. He is always delighted to visit the animals; but this day he was doubly eager, having a special object in view. It's wonderful how much more one can see and enjoy at such a place when he knows beforehand what he is going to look for!

It was just supper time when the boys returned, and Johnny was so excited by what he had seen that he could scarcely stop to eat.

"What is the matter with the boy?" his mother asked, in amazement at the torrent of observations and questions he poured out as soon as I entered the room.

"He's crazy about eyes," said Fred. "His head's full of them."

"Full of nonsense!" exclaimed Mary, who is just old enough to think that what she doesn't know isn't worth knowing.

Fred laughed; and seeing that Johnny was making himself altogether too prominent for a little fellow, I begged him to desist, which he did, with something like a heroic effort.

When supper was over and we had retired to the sitting-room, I said to Johnny, who was hovering round, fairly aching to have his talk out, "Now, Johnny, let us hear what discoveries you have made to-day."

"Discoveries!" cried Mary. "What could *he* do making discoveries?"

"Listen awhile, and perhaps you'll learn," I said. "You

know that anything he finds out for himself is a discovery *to him*, whatever it may be to any one else."

All this time Johnny's story was running on, his thoughts tumbling over each other like a flock of runaway sheep. He was too excited to talk straight. "Not so fast! not so fast!" said I. "We'll never get anywhere if you go on at that rate. Tell us, to begin with, what you noticed first."

"Of the animals?"

"Yes; what animal's eyes did you notice first?"

"A goat," said Johnny, "but he wasn't in the Park."

"Never mind; tell us about him."

"He was eating a sheet of paper in the gutter, just outside of the Park."

"Eating paper?" This from Mary: then turning to me she said, "Goats don't eat paper; do they?"

"Yes," said Johnny stoutly, "brown paper."

"Johnny is right," said I. Brown paper is made of straw, which goats like; and when the poor things are hungry they are not very particular whether their straw is in its natural state or whether some one has turned it into wrapping paper. But our talk was to be about eyes, I believe. What kind had the goat?"

"Ugly eyes," said Johnny; "they're just like cat's eyes turned over."

"Inside?"

"Yes, inside," he said. "Goats wink like anybody; but the ———the———"

"*Pupil*," I said, as he hesitated.

"*Pupil*," he repeated, "the pupil shuts up level, *so*," and he held his hand flat before his eyes. "Pussy's eyes are just the other way, you know."

"So there are at least *three* different styles of eyes that you have seen,—like pussy's, like the goats, and like——?"

"Humpty's," said Johnny.

"We'll call that kind *dog* eyes," said I; "and the others *cat* eyes and *goat* eyes. The inner cuatain of a dog's eyes closes the pupil, (that is the window of the eye) like this: O, o, ₒ, the pupil remaining always round. In the cat's eyes it closes so O, 0, ₀. And in the goat's this way, O, ⁼, ⁻," I said, marking the forms with a pencil.

"I never knew that before," said Mary, beginning to have a wholesome respect for Johnny's superior knowledge.

"You see, then, how needful it is to be careful not to accuse others of talking nonsense just because we happen not to understand all they say."

Mary said nothing; but I guess she will not forget the lesson very soon.

"What are those holes for?" Johnny inquired, seeing me cut a number of oval slits and round holes in a card.

"I want to show you the different styles of pupils. Here is a series of round holes beginning quite large and ending small. Now if you hold them close to your eye, and look at them one after another, you will see the circle of sight grow smaller and smaller till it is only a small round spot. That is the way with our eyes and the dog's when the pupil contracts. Now, hold the card so that the narrow holes stand upright—so—and you'll see how pussy's eyes change as the light grows brighter."

"Let me see," said Fred.

"That sort of pupil, you see, cuts off the light from the sides. The range of sights is narrowed, but up and down you can see as well as ever. Have you ever noticed pussy when she was eating anything in a light place?"

"She growls," said Johnny.

"She keeps turning her head from side to side, to see if any one is coming," said Fred.

"She turns her head because she can't see far on either side without doing it. Her sight is straight ahead."

"That sort of eye wouldn't do for us," said Fred, trying the holes.

"Not very well," I replied. "We do not skulk in coverts like cats, and need to see all around and up and down equally well. Now turn the card the other way, so as to make your field of vision like that of a goat."

"The field is wide enough," Fred remarked, "but I can't see up and down at all without moving my head."

"That sort of light would suit us no better than the cat's," said I, as the younger children were trying the card. "Though it might do for the Esquimaux. It would save them the trouble of making bone spectacles as they do, that is, eye-cov-

ers with narrow slits in them, to shield their eyes from the glare of the sun on the snow and ice. You get the same effect nearly by looking between half-closed lids. But all this is a great way from Johnny and the Central Park. You know what different kinds of eyes there are, Johnny; now let us hear what kinds of animals they belong to."

"Wild-cats have eyes like pussy's," he said; and "tigers, and leopards, and lions, too, I guess, but they were so high up I couldn't see them very well."

"Lions have *cat*-eyes too: and panthers."

"Panther kittens," said Johnny; "funny little rascals! I'd like to have them tame. The old panther was asleep and wouldn't look up."

"Her eyes are the same; and so are the eyes of a good many other animals which have claws like pussy, and the same sort of tongues and teeth. They hunt like pussy, too, and purr, and eat flesh. They are all cats. Were there any with eyes like Humpty's?"

"A good many: the bears—but I couldn't see the big Grizzley's eyes, he was asleep in his den: the foxes; the 'coons were asleep; the kangaroo has pretty eyes, but he's shy. The foxes' eyes looked like a dog's, but they were lazy. They'd just lie with their noses on their paws and blink at you, as Humpty does by the fire. The wolves wouldn't stand still; they're almost as bad as the—the—what did you call 'em, Fred? those ugly spotted things over the panther kittens."

"Oh! the hyenas," said Fred.

"I couldn't see their eyes more than a second at a time," Johnny went on; "they looked like dogs' eyes, *some*, only awfully sneaky."

"You'll have to try them again another day. Were there any with eyes like a goat's?"

"A few," said Johnny; "the grunting cow was one."

"He means the Yak," Fred explained.

"Did you see any common cows?"

"They were tied on the grass where I couldn't get to them."

"Any sheep?"

"The sheep were on the other side of the park," Fred answered.

"The zebra had 'em," Johnny said.

"Did you notice any horses' eyes?"

"I didn't see any close enough; but I will, the first chance I get. I couldn't see the deer's eyes either, nor the buffalo's, they were too far off. I saw the—the—those animals with long necks, Fred, and funny little heads, there in the corner."

"Giraffes?"

"Yes, the 'raffes; one put his head down to me and wrinkled his nose. His eyes were a little like a goat's—only big and black and handsome. I couldn't get near enough to the elephant—he has such little pig eyes—and there was such a crowd around him. You ought to have heard him scream when he couldn't steal any more hay from the camel. It made him terribly angry, and he had more than he could eat in his own stall all the time."

"How were the camel's eyes?"

"They were big enough, but I couldn't get a chance to see them right. Besides, it was getting too dark in there to see much, and we had to come home. But Fred has promised to take me there again some fine day."

"Take me, too, Fred!" cried Mary, eagerly. She always turned up her nose at the animals before.

"Be sure you remember the sheep," I said, "and the cows and horses, if you see any. And take a look at the birds too —the owls and the eagles and the rest. You'll find their eyes worth looking at closely."—*Christian Union.*

ON TITLES.

F. P. LANTRY, MANLIUS, N. Y.

Man is naturally a toady. Likewise an autocrat. This is a paradox, but not a contradiction, for the toady manifests himself in our involuntary reverence for titles, and the autocrat is revealed in the eagerness with which we acknowledge and cling to titles which toadyism confers. A mayor of some seven-by-nine city, an assemblyman from some obscure district, a dummy on the bench who officiates as a justice of sessions, will never forgive the correspondent who fails to address his

letters to the "*Hon.* John Doe," or the chairman of a primary who omits to introduce as orator the "*Hon.* Richard Roe."

A paragraph going the rounds of the weekly papers is suggestive: A Colorado paper says that somebody at the bar of a corner saloon shouted, "Halloo! Professor, have a drink?" Thereupon six red-nosed loafers aroused themselves from semi-somnolency and said, "Whisky sour;" a boot-black complacently remarked, "Brandy-smash," and a corn-doctor passing the door stepped briskly in and smilingly called for "Rum and sugar."

On our way to the State Teachers' Association held at Saratoga two years ago, we were detained a few minutes at Schenectady, and there was much chatting on the depot platform. A quiet, gentlemanly-looking man was approached by a much bewhiskered individual with a gushing "How do you do?" "I haven't the honor of knowing you, sir." "I am *Professor* Dobbs of Smithtown." It would have done you good to have heard the keen sarcasm in the quiet reply, "I am at your service, *Mr.* Dobbs." The whole affair will be understood by remarking that Smithtown Academy is an ordinary union school with a very small-sized academic department, and that *Prof.* Dobbs' specialty is penmanship.

Among people not in the business of instruction, whose ideas on the subject of teachers' grades must necessarily come at second hand, whose traditions on the question of educational titles are summed up in the words "doctor" and "professor" as applied to a revered college president or a grave and dignified college instructor, the whole business must have become inextricably mixed. Such a man hears of Prof. Jones, the chiropodist, and learns that *he* is a corn-doctor; hears of Professor Brown, and learns that *he* is an exhibiter of stereoscopic views; hears of Prof. Smith, and discovers that *he* is a barber; hears of Prof. Johnson, and learns that *he* is a balloonist; hears of Prof. Dobbs, and knows that *he* is a teacher of penmanship in Smithtown Academy; and then propounds to himself the conundrum: "How am I to know that *Prof.* Tyndall occupies a chair in the Royal Institute of London? Does it not seem that a 'professor' is a two-cent affair? Why is this thus? And if not thus, why this appearance of thusness?" Echo answers, "Why?"

Fellow teachers, have we not run this "Professor" business into the ground?" I grant you that we are no better on the "doctor" question than on the "professor" question, for the State laws allows any quack to call himself doctor; but does this "doctor" cure us of our "professor?" They do these things much better in England. There the most distinguished surgeons and physicians are plain Mr. Even in the army and navy, in which discipline requires the most ample recognition of titles and dignities, all officers below the rank of captain are plain Mr. No instructor occupying a position less dignified than a college chair in one of the universities or the royal institution, is thought of as a "professor;" but in this country a barber, the head of a college, a peripatetic exhibiter of photographs, and a principal of a village school, are alike dubbed "professor."

Let us throw aside this childishly aristocratic toadyism which has crept in among us, let us unanimously abolish the "professor," and throw ourselves back upon the immeasurably superior dignity of a plain Mr.

July 28–30, there is to be a State Teachers' Association at Binghamton, and while I earnestly hope that every *teacker* in the State may attend, I quite as earnestly hope that not a single *professor* will be present, unless, indeed, the colleges be represented.

JOHNNY BURNS HIMSELF WITHOUT FIRE.

BY ADAM STWIN.

Johnny found a big brass button the other day, and set to work to make it shine by rubbing it on a piece of woolen cloth.

"Isn't it bright?" he said, after working awhile. "Just like gold."

He rubbed away again for a moment as hard as he could, then—to brush off some chalk-dust that clung to the button, for I had told him to chalk the cloth to make it brighten the button quicker—he put the brass to the back of his hand.

"Ow!" he cried, dropping the button.

"What's the matter?"

"It's hot."

"Hot!" echoed Mary, laying down her book. "How can it be hot?"

"I don't know," said Johnny. "but it burnt me."

"Nonsense!" replied Mary, picking up the button. "It's as cold as anything."

"It's cold now, may-be," Johnny admitted. "But it was hot —*warm* anyway."

"What a silly boy! You just imagined it."

"I didn't," retorted Johnny.

Seeing that they were likely to do as a great many older people have done, dispute about a matter that neither understood, I took the button and rubbed it smartly on my coat sleeve, and put it to Mary's cheek.

"There!" exclaimed Johnny, as Mary cried "Oh!" and put her hand to her face.

"I shouldn't have thought your arm could make it so warm," she said.

I rubbed the button on the table-cloth and placed it once more against her cheek, saying, "It couldn't have been my arm that warmed it this time."

"Of course not," observed Johnny, patronizingly.

"What *did* warm it?" Mary asked, her interest fully awakened.

"That's a good puzzle for you two to work at," I said. "Don't rub the button on the varnished furniture or on the marble table, for it might scratch them; but you can try anything else."

They worked at the puzzle a long time and still were puzzled.

"Maybe the heat comes from our fingers," Mary suggested at last.

I thrust a stick through the eye of the button so that it could be held without touching the hand, rubbed it a moment on the carpet, and it was as hot as ever.

"I guess it's just the rubbing," said Johnny.

"A very good guess indeed, for that is precisely where the heat comes from," I replied. *How* it comes is not so easy to explain to those of your age. The simple fact that heat comes from rubbing is enough, perhaps, for you to know about it now. We say that rubbing makes *friction*, and friction develops heat. When you are older, I'll try to make it all clear to you."

"I thought heat always came from fire," said Mary, "or else from the sun."

"Sun-heat is fire heat too, it is believed," I replied; "but there are still other sources of heat—our bodies, for instance. We keep warm when out of the sunshine and away from the fire."

"I didn't think of that," said Mary.

"Do you remember the day the masons were pouring water on a pile of quicklime to make mortar for the new house over the way? The lime hissed and crackled, sending up great clouds of steam. I have a piece of quicklime here, and see! when I pour water on it how it drinks up the water and grows hot. I saw a wagon loaded with lime set on fire once by a shower of rain."

"Fred told me about that, and I didn't believe him. Who'd expect fire from water?"

"Get me a small piece of ice, and I'll show you how even that may kindle a fire."

While Mary was getting the ice, I took from my cabinet a small vial with a metal bead at the bottom.

"Is it lead?" asked Johnny, when I showed it to him.

"It is potassium," I said, "and I'm going to set a little piece of it a-fire with the ice Mary has brought. There!"

"Isn't it splendid!" cried Mary, as the metal flashed into flame.

"You can do anything, can't you?" said Johnny admiringly. His confidence in my ability is something frightful. Really, if I were to tell him I could set the moon a-fire, I think he'd believe me!

"No, Johnny," I replied. "There are very few things that I can do, as you will discover in time. But now, while we are talking of heat, let me show you another way of warming things. Please fetch me a flat-iron, Mary, while Johnny brings my little hammer. Thank you! Now watch me while I pound this piece of lead, and put your finger on it when I stop. Now!"

"Does the pounding heat it?"

"It does. I have seen a blacksmith take a piece of cold iron and hammer it on a cold anvil with a cold hammer until it was hot enough to set wood a-fire."

"Where did the heat come from?"

"From the blacksmith's arm, but in such a roundabout way that I should only puzzle you if I tried to describe it. You have seen that heat does come from fire, from the sun, from our bodies, from rubbing, from pounding, and from mixing things, such as quicklime and water; *how* it comes in either case you will learn by-and-by, when you are older."

"But we have got a long way from Johnny's button. Can you think of any other time you have seen things heated by rubbing?"

"We rub our hands when they are cold," Mary said, seeing Fred go through these motions, having just come in from out-doors.

"I'll tell you something I noticed coming across the bridge," said Fred. "It was freezing cold, yet the snow in the sled-tracks was melted when a heavy sleigh passed, leaving the boards bare sometimes. I couldn't think what made it; was it friction?"

"Evidently. I've noticed the same thing many times. The snow 'wears out,' as the teamsters say—that is, the heat of the rubbing melts it."

"I've read of savages making fire by rubbing sticks together," Fred continued.

"They have several ways of doing it—or rather different savages have different ways. One of the simplest is to rub one stick in a groove in another, rubbing briskly and bearing on hard. There is a bit of soft pine board that I tried the experiment with the other day. That is it. See! when I plow this stick up and down in the groove, the fine wood-dust that gathers at the bottom begins to smoke a little and turn black. By working long enough and fast enough I could set the dust on fire; but it is too tiresome when a match will do as well, and one can buy a whole bunch of matches for a penny. We get our fire by rubbing too, only we use something that kindles quicker than wood, so that a single scratch on some rough surface develops heat enough to light it."

"What is it?" Mary asked.

"Phosphorus; I have some in this bottle. You rub the button, Johnny, while I take some of it out on the point of my knife. Now touch it with the button. See! it is hot enough to set the phosphorus a-fire. We might kindle our fires that

way, but we find it more convenient to put the phosphorus on the end of a stick and mix it with something to keep it from lighting too easily. Then all we have to do is to rub the phosphorus point against anything rough, the friction heats it, it takes fire, and our light is ready. Did you ever hear of the traveler who was stopped by some barbarous people who knew nothing of matches? They would not let him go through their country, and, while they were debating whether to kill him or send him back, he grew tired of waiting and thought he would take a smoke. So he filled his pipe, and taking a match from his pocket struck it against his boot, lighted his pipe, and thought no more about it. To his surprise, the people who were watching him suddenly ran off, and directly there was a great commotion in the village. After a while the chief men came back very humbly, bringing him loads of presents, and begged him to go his way in peace. What was the reason? They had seen him draw fire from his foot, as they thought, and were afraid that such a great conjurer might burn them all up if they offended him. That was a lucky match for the traveler.—*Christian Union.*

LAST year the public schools of San Francisco cost the sum of $686,419 89—almost as much as the entire expenses of the State Government—and not a dollar was expended in the erection of buildings.

SAN FRANCISCO contains over one hundred colleges, seminaries and other private schools, and has a public school department that costs nearly three quarters of a million annually.

A JAPANESE young lady, who came to this country three years ago, bore off four of the highest prizes at a Washington Seminary last week.

THE *Register* says School Superintendent Ford, of Napa, has appointed Mrs. E. A. Wood one of the School Trustees of Franklin District.

THE Professors, instructors and members of the Senior and Junior classes of the State University are organizing a Scientific and Literary Association.

EX-GOVERNOR HAIGHT is a School Director of the Alameda Board of Education.

STRONG efforts are being made to establish a Kindergarten in Santa Barbara.

A NEW $18,000 school house is to be built in East Oakland immediately.

THE Alameda Board of Education have instituted a High School Class.

THE City Superintendent of San Jose gets $100 per month.

DEPARTMENT OF PUBLIC INSTRUCTION.

ANOTHER edition of the School Law will soon be ready for distribution. Three copies will be sent to every district, through the County Superintendent. A few County Superintendents seem not to know that according to subdivision 8 of section 1543, it is their duty "to distribute all laws, reports, circulars, instructions and blanks, which they may receive for the use of school officers." Almost two months ago we sent to every County Superintendent enough copies of the School Law to allow him to distribute one copy to each district clerk and each teacher, and we notified each County Superintendent to so distribute the Laws. Yet we learn that in not a few instances the County Superintendent, instead of distributing the Laws as requested by us, kept them in his office, and distributed them to any one who happened into the office and asked for a copy. Now County Superintendents must not distribute any laws, reports, circulars, instructions and blanks, *except to the school officers for whom they are designed*. This Department is only authorized to print the books, blanks, etc., needed by school officers; and we can not supply every citizen who desires a copy of a book, blank, or law. The Laws which we shall shortly send are to be distributed by sending three copies to each district, in order to give a copy to each of the two trustees not yet supplied, and to have a copy also placed in the district library. This with the Laws heretofore distributed, will give each trustee, each teacher and each district library a copy, giving at least five copies to each district, certainly enough for the wants of all citizens who desire to consult the School Law. No more School Laws will be printed, and no more will be furnished. All books, laws, blanks, etc., furnished by this Department are State property, and must be delivered to successor in office.

IN the TEACHER for December, 1873, we decided the question whether a Board of Trustees can maintain separate schools in different parts of the district. We there stated that we hold it to be the plain duty of Trustees to establish as many schools, and in as many places, as the needs of a district may demand. We hold the same opinion still, and only can add that "Boards of Trustees and Boards of Education must maintain all the schools established by them for an equal length of time during the year, and as far as practicable, with equal rights and privileges." (Section 1619.) Trustees can not, therefore, maintain a school in one part of the district for three months, and a school in another part of the district for seven months.

A TRUSTEE asks whether a teacher ought to require the more advanced classes to hear the recitations of the lower classes. As a general answer, we give a decided *no;* for teaching consists as much in hearing recitations as in giving instruction. There may be cases where the teacher may profitably avail himself of the help of older scholars; such as the correcting of written exercises, of mistakes made by the lower classes, etc. But even in these cases great caution is necessary not to depend too much upon the proficiency and conscientiousness of the corrector. In no case ought the teacher to delegate to a scholar his office as instructor, no matter how far advanced the scholar may be.

A COUNTY Superintendent asks us whether it would not be legal "to use the one hundred dollars set apart by law for Institute expenses, to defray in whole or in part the traveling expenses of teachers coming from distant parts of the county." He adds that "the teachers keenly feel their loss, and unless they receive some compensation," he fears that any future County Institute will be a failure on account of the non-attendance of these teachers. This County Superintendent seems to have forgotten that the Law has already made provision to protect teachers against pecuniary loss incurred in attending Institutes, by providing in section 1563, that "when the Institute is held during the time that teachers are employed in teaching, their pay must not be diminished by reason of their attendance." Certainly a more liberal provision could not be desired; and no other profession enjoys the privilege of undiminished salary on account of attending conventions or institutes called for the purpose of mutual improvement and advancement. If County Institutes confer upon the profession one half of the blessings which are claimed for them, teachers ought to be eager to secure these blessings, even if section 1563 were repealed. But if the professional spirit of teachers is so low and mercenary that they demand the reimbursement of their traveling expenses in addition to their regular salary for the time spent in attendance, we are of the opinion of many people that the cost of Institutes is altogether out of proportion to the benefits derived from them. The *esprit de corps* of teachers is already questionable enough, in many respects; it will become contemptible if the County Superintendent above mentioned speaks for a respectable number of teachers.

WE may mention in this connection that city teachers who are obliged to attend City Institutes are not exempted, nor ever were exempted from attendance at County Institute. The School Law of 1870 made provision that "any *county* [and not city] in which the teachers have a regularly organized County Association or Institute, and hold regularly monthly meetings during the year, shall be exempted from the provisions of this section whenever a majority of the teachers of said county shall determine by vote to sustain such monthly associations." This provision was not incorporated into the Political Code. But we think that such monthly meetings are nevertheless to all intents and purposes the Teachers' Institutes required to be held in certain counties, according to section 1560; and any county sustaining the above mentioned County Association or Institute need not hold any other Teachers' Institute.

OUR attention has been called to the fact that the Board of Education of a certain city has adopted a course of study, quite different from the course of study prescribed by the State Board of Education. We think there are several cities which have done the same. The Boards of Education of these cities seem not to know that it is the duty of the *State Board of Education* to prescribe and enforce the course of study in the public schools; no city, incorporated town, or district is excepted by law. Subdivision ten of section 1617, makes it the duty of Boards of Trustees of school districts and of *Boards of Education in cities* to enforce in schools the course of study and the use of text-books prescribed and adopted by the State Board of Education. The State Board of Education has prescribed a course of study; and this course of study, and none other, must be enforced in

every city and town as well as in every other school district. For High Schools no course has been prescribed, but simply an outline is given of the studies to be pursued. We hereby notify all Boards of Trustees and Boards of Education that we shall strictly enforce the law in regard to the course of study; and any school district—whether city or county—which neglects or refuses to adopt and use the State course of study, is not a school district, and can receive no apportionments of school moneys.

The law does not, however, debar Boards of Education of cities from authorizing studies other than prescribed by the State Board of Education. But no such additional studies must be pursued to the neglect or exclusion of the studies prescribed by the State Board of Education.

WE have also been creditably informed that in the schools of certain cities are used text-books other than those prescribed by the State Board of Education. Thus we hear that in some cities French's First Lessons in Arithmetic, Swinton's Word Book, Robinson's Intellectual Arithmetic, Hopkins' Manual of American Ideas, etc., are used. None of these books can be used in any public school. Section 1875 distinctly states that "if any *city* or district refuse or neglect to use the books that may be prescribed, or use *any other* books in any of the prescribed studies, the Superintendent of Public Instruction must withhold from such city, town, or district, twenty-five per cent. of all State school moneys to which it may be entitled, until it comply." San Francisco alone is excepted from the State series of text-books. We were in favor of excepting all cities and incorporated towns, but were overborne in the matter, and it is now our sworn duty to execute the law.

We hereby require County Superintendents to report to us on or before Nov. 1st, 1874, in accordance with subdivision 14, of section 1543, the names of all the districts in their respective counties, and to note opposite the name of each district whether or not the State series of text-books has been used exclusively, and the State course of studies has been enforced. No County Superintendent must report on hear-say, but only from actual knowledge. The penalty for failure to make such report is prescribed in section 1544. What books must be used exclusively, can be learned from an examination of the Course of Study.

IT will be noticed that section 1859 prescribes that "any school district which neglects or refuses to adopt and use the State series of text-books, and State course of studies required by law, is not a school district within the meaning of this Article." Section 1875 prescribes that "if any city or district refuse or neglect to use the books that may be prescribed, or use any other text-books in any of the prescribed studies, the Superintendent of Public Instruction must withhold from such city, town or district, twenty-five per cent. of all State school moneys to which it may be entitled, until it comply; and any moneys so withheld must be apportioned by the Superintendent at the next annual apportionment, in the same manner as other school moneys in the Treasury." From these two sections we infer that while this Department must apportion to every county its pro rata apportionment of State school money, and withhold only twenty-five per cent. of the pro rata to be apportioned to the cities or districts which have not complied with the provisions of sections 1859 and 1875, the County Superin-

tendent must, on the other hand, ignore such cities or districts altogether, and apportion to them no school funds whatever, whether State or county.

THE question has been asked us several times, and by as many County Superintendents, what should be done with the school moneys withheld from any district, either for not keeping a three months' school, or for not complying with the provisions of sections 1859 and 1875. We do not see how any question can arise on this subject. The county receives a certain amount of school fund, either from the State or county. This amount is apportioned to *the districts entitled to school moneys*, by dividing the amount in the number of teachers assigned to those districts. This manner of apportioning school moneys was fully explained and illustrated in the August TEACHER.

SEVERAL County Superintendents have asked what should be done with school moneys to the credit of districts which are not entitled to any school moneys during the present school year. We have already stated on some former occasion, that a district never loses its organization except it voluntarily unites or incorporates with some other district. In this case, the moneys to the credit of the district go, of course, to the district with which it unites. But as long as a district does not voluntarily surrender its organization, all moneys apportioned to that district are under the exclusive control of its Board of Trustees, to be expended according to law, and the County Superintendent has no further control over such moneys, except to see that they are expended according to law. These moneys may remain in the treasury for years, until they are used; but the County Superintendent can not withdraw the moneys from the district and apportion them to the other districts, or use them for any other purpose.

EDUCATIONAL ITEMS.

CALIFORNIA.

THE Board of School Trustees of San Rafael have appointed a truant officer, and adopted a set of rules and regulations from which we take the following: Any pupil above the third grade failing to reach the standard of 60 per cent. for deportment in any one month shall be suspended from the school until restored by the Board.

EVENING SCHOOL.—The evening schools of San Francisco, which were reopened last week, promise to be a most gratifying success. Ten classes were organized. A large majority of the pupils attending are grown-up men and women, eagerly striving to improve themselves in those branches in which they feel that they are most deficient.

SCHOOL BOOKS.—Several of the Grangers of the State have passed resolutions like this: "*Resolved*, That it is the sense of this Grange that the frequent change

of text-books for use in the common schools is injudicious, unjust and unwise; that the books we now have are sufficient in unmber, and good enough in quality."

THE representative press, we are glad to note, is generally tak grounding against the cramming of school children's heads with special studies. This is an evil of greater magnitude than is popularly supposed. These studies are forced into the minds of pupils at an age when the reasoning powers are undeveloped and the memory in its highest state of receptivity.

THERE are in Oakland, altogether,one High School, one Cosmopolitan School, eight Grammar and Primary Schools, with sixty teachers and an attendance of 2,612 children. Besides these public schools there are several private academies and four or five private schools.

SAYS the Nevada *Transcript;* "We learn that the compulsory education law has had the effect to fill up those schools which have been in session since July. In one district pupils have attended regularly the last month, for the first time in several years."

THE people of Woodland, Yolo county, have been exercised over the question of admitting colored children into the public schools with the whites. The School Trustees finally decided to keep up a separate school for the ten colored children.

ON the opening of the San Jose public schools it was found that the supply of school room was utterly inadequate, and three grades had to be left out in the cold. Compulsory education will be a dead letter there until some more school houses are built.

THE question of admitting colored children into the public schools came up recently before the Alameda Board of education. The motion of admission was carried, only two voting against it. Ex-Governor H. H. Haight sustained it strongly.

BOOK NOTICES.

ELEMENTS OF THE ENGLISH LANGUAGE; an Introduction to the Study of Grammar and Composition. By Bernard Bigsby, Univ. Oxon. Boston: Ginn Bros. San Francisco: Payot, Upham & Co.

This book is divided into five parts. Part I treats of the Elements of Grammar, and teaches them, not by grammatical rules which are of no signification to a child, but by practical exercises calculated to give a knowledge of the character of the parts of speech, and to show, at the same time, the usefulness of such knowledge. The author has not been uniformly happy and successful in his mode of presenting the subject, but the thoughtful and careful teacher will soon be able to remedy any shortcomings in this respect.

Part II treats of the formation of sentences and gives a useful system of elementary training in composition. The author has been very happy in his choice of material, and of the method of teaching composition. The acquisition of correct expression is provided for; the means of cultivating habits of thought and observation are given. The exercises are on simple and familiar objects generally visible to the child at the time of study—the child's attention being thus more readily awakened, and its interest sustained. The arrangement of lessons is, on

the whole, excellent; though here, as well as in the first part, we notice slight traces of unfitness in the method of introducing a lesson.

Part III treats of the construction of paragraphs; Part IV, of figures of speech; Part V, of the structure of themes. These portions of the work are very unsatisfactory in regard to the material selected and the methods of instruction suggested, if we bear in mind the object of the work. The author has attempted too much; and in trying to combine the elements of composition—which are all we can teach in the common schools—with the lessons of a higher order which belong legitimately to the high school or college, he has defeated the object in view, viz: of producing a work which can be adopted in our common schools. It is just such teaching of composition as required especially in Parts IV and V of the work under consideration, that composition has become the bugbear it is in the whole school course.

Parts I and II, and portions of Part III, will, however, give the teacher many a hint to make composition writing an attractive and valuable school exercise.

ALL THE FRENCH VERBS AT A GLANCE; WITH PRACTICAL ELUCIDATIONS OF ALL THE FRENCH SOUNDS, AND COMPREHENSIVE TABLE OF PRONOUNS. By Etienne Lambert and Alfred Sardou. New York: Albert Mason. San Francisco: Payot, Upham & Co.

Its very full title will explain the object of the book. From a hasty glance at its contents, we can recommend the work as a *vade mecum* to every student of the French Language. The book will not relieve the student from the hard and long continued work necessary to learn any foreign language; but it may facilitate the mastering of the more serious difficulties encountered in the acquisition of the language.

COMPLETE ARITHMETIC, THEORETICAL AND PRACTICAL. By Wm. G. Peck, L. L. D. New York: A. S. Barnes & Co.

We can not see in which particular this arithmetic differs materially from the many works on the same subject already before the public.

LANGUAGE LESSONS FOR BEGINNERS. By Jno. S. Hart, L. L. D. Philadelphia: Eldredge & Brother.

This book is intended to be put into the hands of children as soon as they are able to write their own names. It consists of a series of written exercises by means of which the child learns first the peculiar uses and properties of the various kinds of words, and then the names by which these properties and uses are called. The book is certainly a simple and easy introduction to the study of grammar. We confidently commend its plan to all teachers; but we should strenuously object to put the book into the hands of any child, for first, no text-book on grammar should ever be placed in the hands of scholars below the first grade; and secondly, the frequent exercises for correction in spelling, punctuation, etc., given in the book, lead the scholar to pay most attention to, and become most familiar with the errors in spelling, punctuation, etc. thus presented. The errors naturally made by the child will furnish abundant material for correcting exercises; we need not suggest other possible ways of misspelling words. Another serious fault we have to find with the author is the anxiety he manifests to drill, and to drill, most generally, in matters which can have no significance to chil-

dren. Thus at the end of the first exercise, which, by the by, is a very valuable and necessary exercise, the essence of the whole lesson in the author's opinion, seems to be comprised in the definition to be committed to memory that "the name of any *person* is called a noun." Now in our opinion, the chief if not sole value of the lesson is to teach the pupil the correct spelling, capitalizing and punctuating of the full names of persons. That "the name of any person is called a noun" is not a legitimate result of the lesson; for the child can see no reason why the name of any person should be called a noun. But if after a time, we desire to teach the child, for instance, the formation of the plural of the names of persons, places, animals, plants, things, etc., the child can readily see the usefulness of having the one term *noun* standing for the name of any person, place, or thing; so that under *noun* are included all the words which are used as *names*. Similar minuteness and uselessness of drilling and teaching definitions run through the work.

A GRAMMAR OF THE ENGLISH LANGUAGE, WITH AN ANALYSIS OF THE SENTENCE. By John S. Hart, L. L. D. Philadelphia: Eldredge & Brother.

This grammar does not differ materially in plan and execution from Goold Brown's *Institutes*.

THE NORMAL DEBATER. By O. P. Kinsey. Cincinnati: Geo. E. Stevens & Co.

This book is designed for the use of all common schools, academies and colleges, as well as a guide for teacher's institutes and business meetings in general. The work gives a general outline of the commoner principles of parliamentary rules.

A NEW MAP OF THE STATE OF CALIFORNIA.

We take great pleasure in calling the attention of Trustees to a new edition of the map of the State of California, designed and prepared by the Geological Survey, and now issued by authority of the Regents of the University of California. Considering that this is the only map in existence, presenting correctly the topographical features of our State, which enables pupils as well as teachers to get a correct idea of her mountain and river systems and her climate, it seems to us highly desirable and necessary that this map should adorn and embellish the walls of every school-room in the State, the more so, since Trustees are now empowered to use the money set apart for library purposes, for the purchase of apparatus. The map is constructed on the scale of eighteen miles to one inch, and is highly instructive as well as an ornament, not for the school-room only, but for every parlor and sitting room in the State. We feel really proud that the Regents were able to effect this new and revised edition of this beautiful and ornamental map of our State. Besides California, this map represents also our neighboring State, Nevada. There are few maps in existence, certainly none in the United States, that compare favorably with this piece of ardent labor and highly finished touch of art. The first edition was sold before any of our school trustees were aware of its existence. We hope, however, that this second edition will find its way largely into our Public Schools. The map can be obtained from Chas. Rabe, Montgomery Block, San Francisco. Price, five dollars.

THREE THOUSAND PRACTICAL WORDS, with an appendix containing Rules for Spelling, Rules for Capitals, etc. By J. Willis Westlake, A. M. Philadelphia: Eldredge & Brother.

This book aims to give a collection of just such words as a student needs to study, unencumbered by those of which he is already master, or which are so rarely employed as to be of but little use to him.

ST. NICHOLAS FOR OCTOBER.

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SECOND TERM.

Opens Wednesday, November 4th, 1874, and closes March 25th, 1875.
Christmas vacation, from December 23d to January 4th, inclusive.

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Lecture before literary societies, Wednesday evening.
Graduating exercises, Thursday, 2 o'clock, P. M.
Alumni Association, literary exercises, Thursday evening.

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THE

CALIFORNIA TEACHER.

NOVEMBER, 1874.

VOL. XII. SACRAMENTO. No. 5

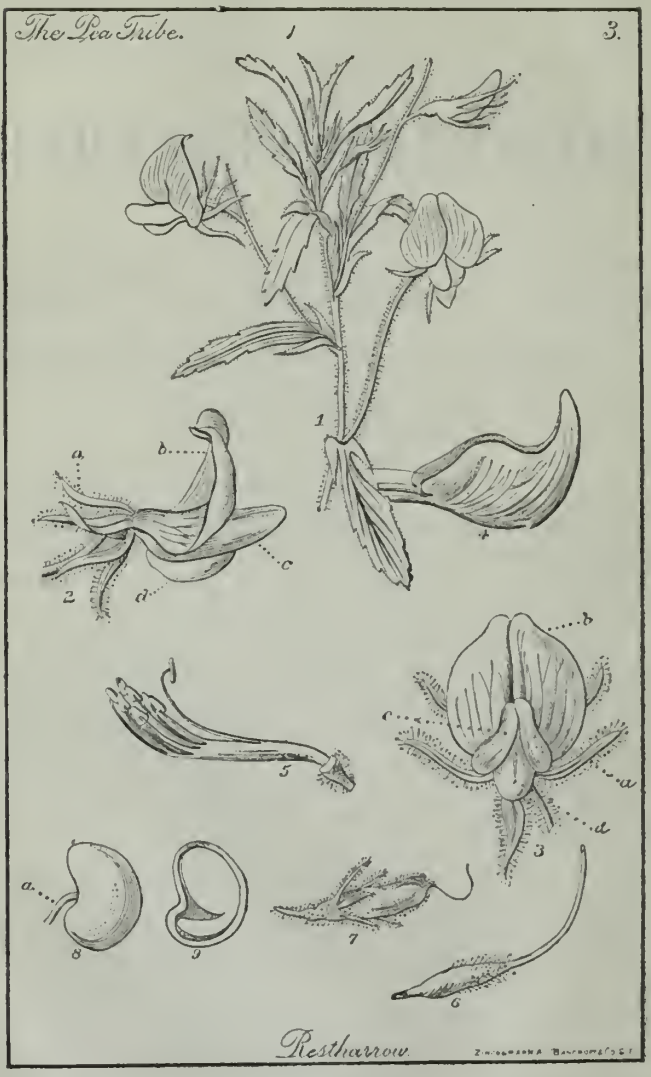
[*For the California Teacher.*]

BOTANY FOR SCHOOLS.

III. PEA FAMILY—*Leguminosae.*

There is, perhaps, no natural order of plants which is more easily recognized, than the Pea family, or one in which greater interest is usually taken; it is so rich in plants useful for food, as the Pea, Bean, etc., or for forage, as Clover and Alfalfa; or dyes, as Indigo and Logwood; or timber, as Rosewood and the American Locust trees; or medicine, as the Senna plant; or gums, as the Arabian Accacia; and attractive for their beauty, as *Robinias*, Lupines, *Swainsonias*, *Clianthus*, Sweet-Peas, and a large number of others, too numerous to enumerate. Most all of the plants above mentioned, are largely cultivated in our gardens and fields. It is, therefore quite easy to procure specimens for examination.

The Pea family consists of plants bearing pods, formed upon the same plan as that of the Pea, and called *legumes;* this is the great essential character, and the only one which is universal. It is therefore necessary to teach you, in the first instance, how you are to know a Legume with certainty. Imagine to yourself a carpel, which grows long and flat, and usually contains several seeds, and which, when ripe, separates into two valves or halves; recollect also, that the seeds all grow to one angle only of the inside of the carpel; in a word study a pea-


The Pea Tribe.
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Restharrow.

pod, and you will know what a legume is. You must not expect however, that it will always be exactly like a pea-pod; on the contrary, it is longer or shorter, larger or smaller, harder, thinner, or differently colored, contains more or fewer seeds; or, in short, may vary in many ways: but it will always be formed upon the same plan. This is what you are to take as the character which holds together all the subdivisions of the Pea family.

The most striking feature in these plants, next to the legume, is the singular arrangement of the petals, which gives to a very large proportion of this whole natural order the name of *Papilionaceous*, or Butterfly-flowered. By this title, we distinguish the first division of the Pea family; as an example of which a common Pea or Lupine flower would answer the purpose. (The plant, however, illustrated here is the Restharrow, *Ononis angustifolia*). The calyx is formed of five sepals that unite in a short tube (figs. 2 and 3, *a*). The corolla consists of five petals, one of which is larger, and stands at the back of all the others, wrapping them up before the flower expands (figs. 2 and 3, *b*); this is the *Standard*, or *Vexillum*. In front of the Standard are two smaller petals (figs. 2 and 3, *c*), which are placed nearly parallel with each other, converging a little at the point; they are *Wings*, or *Alae*, and are carefully folded over a boat-shaped curved part of the corolla, which is placed in front of all the rest; this part, called the *Keel*, or *Carina* (figs. 2 and 3, *d*), is formed of two petals, which are slightly united at their lower edge, as you may discern by pulling the keel away from the calyx, when you will see their two stalks (fig. 4); the corrolla is, therefore, formed of the same number of parts as the calyx, but so masked that you would not have, at first, suspected such a thing. This is called a butterfly-shaped flower.

Let us miss the stamens for the present, and pass on to the ovary (fig. 6), which is a tapering green hairy part, gradually narrowing into a style which ends in a minute stigma. Its legume is a short flat body (fig. 7) to which the withered style adheres or sticks. When ripe it splits into two halves, to each of which a seed or two (fig. 8) is attached.

Papilionaceous flowers may be themselves separated into those which have their stamens united, and those which have

their stamens separate. To the first belongs the Restharrow, which has nine of the stamens joined together about half-way (fig. 5), and a tenth a little separated from the others. It is here, also, that are found nearly all those species of the Pea family with which you are likely acquainted. Peas, Beans, Clover and Alfalfa are known to everybody; and these may be easily procured for examination.

The Pea or Pulse family (*Leguminosae*) is one of the largest of the vegetable kingdom. Its members are found all over the globe. They increase in number, beauty and variety towards the equator.

This large family of plants divides itself into three large sub-families. Of every one, we find representatives here in California, either indigenous or exotic.

SUB-FAMILY I. *Papilionaceae* (proper Pea family). General characteristics: sepals imbricated in aestivation; corolla papilionaceous; stamens ten or occasionally fewer, inserted with the petals into the bottom of the calyx.

Belonging to this sub-family we find here: Lupines (*Lupinus.*), Clover (*Trifolium*), Alfalfa (*Medicago Sativa*), Locust-tree (*Robinia*), Bur-clover (*Medicago*), Rattle-weed or Milk-vetch (*Astragalus*), Peas (*Lathyrus*), Australian Pea-vine (*Dolichos*), *Clianthus* and *Swainsonias.*

SUB-FAMILY II. *Caesalpinieae* (Brasiletto family). General characteristics: flowers not papilionaceous; petals spreading equally around the pistil, as in other plants; stamens usually separate and spreading. The irregularity of growth which causes the papilionaceous appearance in the first sub-family, also exists among these plants, so that you will find them with some of their petals and stamens larger than the remainder.

Belonging to this sub-family we find here: Judas-tree (usually a shrub) (*Cercis occidentalis*), Honey-locust (*Gleditschia*), and various species of Cassia, introduced and cultivated in our gardens. These have pinnate leaves and yellow flowers, and generally bloom when our rainy season begins.

SUB-FAMILY III. *Mimoseae* (Mimosa family). General characteristics: sepals and petals so small as to be scarcely visible; flowers in compact clusters; and the stamens not only very numerous, but so long and slender and delicate as to resemble silken threads, tipped with very little anthers.

To this sub-family belong all the beautiful accacias introduced from Australia into our gardens. They bloom chiefly during our rainy season. The Australian settlers call them Wattle-trees.

MANUAL OF INSTRUCTIONS REGARDING THE COURSE OF STUDIES.

§ 6. INSTRUCTION IN LANGUAGE (Continued).

Under the head of *Instruction in Language* we gave last month (§ 6, page 118) some general suggestions concerning the studies of grammar and composition. We confined ourself chiefly to the elucidation of the fact that the technical study of these two branches must be based upon the reading lessons. This month we shall give some more definite instructions in regard to the methods of teaching these two studies.

Grammar is "the art of speaking or writing with propriety or correctness, according to established usage." Language being the subject matter of the study of grammar, we include under "grammar" quite a variety of studies, namely: orthography, etymology, syntax and prosody.* Orthography treats of the names, classes, powers and forms of letters; of syllables and syllabication; of words, and their derivation and composition; and of spelling, or the art of expressing words by their proper letters. The importance of the study of orthography, especially in its last division, has long ago raised it to the dignity of a study separate from grammar. As in conformity with this position of orthography, we have already considered and treated orthography as an independent study, we shall not here recur to this part of grammar, except to give hereafter a few instructions in regard to the drilling of certain rules of orthography.

"Etymology treats of the different parts of speech, with their classes and modifications." The most obvious use of etymology

* As Brown's Grammars are the only text-books on grammar which can be used in the public schools of this State, teachers will naturally be most familiar with Goold Brown's system of grammar. We have therefore adhered to his definitions, divisions, etc. Brown divides grammar into the four parts given in the text; later grammarians reject orthography and prosody as parts of the study of grammar, properly speaking. So Brown gives twenty-four rules of syntax; Hart only sixteen. But for the reason above given, we adhere to Brown's system, and our views are, of course, largely directed by this adherence.

is to prepare the way for the next division of grammar—syntax. But the study of etymology is, *per se*, of considerable theoretical value as a mental disciplinarian, and of even still greater practical value as teaching the uses and definitions of words. There are several methods of instruction in vogue in teaching etymology. The first, and by far the most frequent method, is to teach first the definitions of the parts of speech, and then to parse words according to these definitions. The child is thus introduced first to generalizations, and then to the facts from which these generalizations are derived. We have already stated repeatedly that in all instruction the mind should be introduced to principles through the medium of examples; that is, the mind must be taught to devise general formulas from groups of details, and not to classify details by means of a previously memorized general formula. Thus in grammar we must never begin with the memorizing of the definitions of the parts of speech, and then classify words into the parts of speech by gauging them by these definitions. On the contrary, we must take up first the words themselves, determine their use as naming places or objects, as expressing the qualities of persons, places or objects, as expressing an action or state of being, etc., etc. And in this, the first, if not sole, requisite is that the pupil distinctly recognizes the *office* of the word as a name, or as expressing a quality or an action, etc., and not the *part of speech* to which it belongs.

The learner is usually introduced to etymology about as follows: "A noun is the name of any person, place or thing." Or, in more elementary works: "Whatever we can think of, or say anything about, has a name, and a *name* is a noun." According to these definitions the learner is required to parse all nouns; and the usual phraseology is that such and such a word is a noun, because it is the name of such and such a thing, when the reverse would be more correct; that is, such and such a word being the name of such and such a thing, it belongs to that part of speech called *nouns*.

Another method, more rational than the above, begins with drawing attention to the office of a word, and classifies the word accordingly. Thus, John is the name of a boy; Sacramento, the name of a place; shovel, the name of a thing; the names of persons, places and things, are called nouns; hence,

John, Sacramento and shovel are nouns; and the child is then instructed that "a noun is the name of any person, place or thing." In a similar manner the remaining parts of speech are taught.

This method of teaching the elements of grammar is based upon sound principles; but even with this method we must use great caution not to intrude too soon with the technology of grammar. It is possible to insure the full benefit of the study of etymology without employing the grammatical terms used for naming the parts of speech. We stated above that the study of etymology is, *per se*, of theoretical value as a mental disciplinarian, and of practical value as teaching the uses and definitions of words. For neither of these is it necessary or useful that words be classified. We must bear in mind that a child must be able to understand fully the *raison d'etre* of a generalization before it will appreciate its need and use. A child may soon be able to determine when a word stands as the name of a thing, when a word expresses quality, action or relation, etc., but it does not immediately understand the use and necessity of abandoning the well known word *name* for the unknown and strange word *noun*. It is only when the child has, for instance, to learn or to examine some common modification which names of objects, of places and of persons, undergo, that it will understand the use of having the names of objects, of places and of persons, included under the common term *noun*.

We have thus far confined ourself purposely to only one part of etymology—the classification of words into the parts of speech. For the remaining parts of etymology—the subdivisions and modifications of the parts of speech—are of so little *grammatical* value, that to the pupil such subdivisions must appear superfluous, and in some instances incomprehensible. The particular *kind* of word to be used, will depend *not* upon grammatical rules, but only upon the laws of reason, of logic. The use of the definite or the indefinite article will be determined, not whether the pupil has learned to classify properly the articles into indefinite and definite, but whether the pupil clearly understands when he wishes to speak of *any* object or of a *particular* object. Of what significance can the classification of adjectives into common, proper, numeral, pronominal, participial,

etc., be to the pupil, except that the studying of such classification helps to make grammar one of the most incomprehensible, perplexing and disgusting studies of the school course? The most perfect classification of words will not guide the pupil in his use of words. Such things as that proper nouns, that is the names of persons, places, etc., must begin with a capital, that proper adjectives should begin with a capital, etc., are more easily and more thoroughly taught by lessons specially devoted to the imparting and drilling of such rules of orthography or grammar, than by set lessons in grammar. The pupil will readily, and without any special grammatical knowledge on the subject, use the conjunction necessary to express the connection of the words or sentences, or the dependence of the terms he uses. So the regularity or irregularity, redundancy or defectiveness of a verb does not depend upon the class to which it is assigned by grammarians, but upon its usage in speech; and this usage the pupil will learn only in practice, and not from grammatical analysis.

If we turn now to the last division of etymology, the modifications of words, the inflections of words are few indeed. And yet grammarians have hidden these few inflections in such a mass of rubbish that a child would never learn them were it not that it cannot avoid doing so in spite of the grammarians. Grammarians state that nouns have modifications of four kinds, namely: person, number, gender and case. But in fact the modifications of nouns are confined strictly to numbers, to one case, and to gender in a comparatively very few instances. That all these modifications can be taught independent of so-called grammar-lessons, will not be doubted; and why should we then require pupils to wade through so much distasteful and unintelligible jargon?

In like manner the comparison of adjectives can be more profitably taught, not by requiring the memorizing of the definitions given by grammarians and parsing adjectives according to the rules laid down, but by simple exercises tending to show when the comparative or superlative degree must be used, and how it is formed.

Of pronouns we have but fifty-six; and quite a number of these are nearly obsolete, or used exceptionally. The correct use of the remaining will depend more upon the pupil's skill in the use of language than upon grammatical knowledge.

In English the changes in the form of the verb to indicate distinction of number and of person, are so few that a pupil must be considerably puzzled when he is required to conjugate verbs in order to learn the modifications they undergo to make them agree with the person and number of the subject. Leaving aside the second person, singular number, which is so seldom used as to have become nearly obsolete, we have in the indicative mood one change in the present tense, none in the imperfect, one (in the auxiliary) in the perfect, none in the pluperfect, one (in the auxiliary) in the first and second future, respectively. In the other moods there are absolutely no changes whatever which indicate the person and number of the subject. The changes of the verb being thus so few, the pupil naturally learns them—not by the study of grammar—but by practice; and if a pupil distinctly knows which tense he must use to express his thoughts he will experience no difficulty in using the correct form of the verb, except in the cases of a few irregular verbs, such as *have*, *do*, *be*, *see*; and no studying of grammar, but only systematic exercises, will correct the common faults in the use of these. The use of the correct tenses and moods of verbs depends, not upon grammatical knowledge, but solely upon skill in the use of language, oral and written.

This brings us to the next division of grammar, *syntax*. Syntax is defined as treating of the relation, agreement, government and arrangement of words in sentences. Accepting the correctness of this definition, it will be seen that the modifications of the parts of speech generally treated of in etymology, find their practical illustrations only in syntax, because inflections are consequent upon the relation, agreement, government and arrangement of words in sentences; and in accordance with a principle frequently stated that general formulas or definitions or rules are to be derived from details, the study of inflections should be consequent upon the study of syntax, or the study of the construction of sentences.

The leading principles to be observed in the construction of sentences are stated by Goold Brown in twenty-four rules of syntax. That the formal studying of these rules contributes very little to "the art of speaking or writing with propriety or correctness, according to established usage," is acknowledged and deplored by every teacher. The reason for this is not far

to seek. The relation, agreement and government of words are not indicated, or in only a very few isolated instances, by modification in these words; and the rules of syntax, must, therefore, in a great degree, be meaningless to the pupil. The arrangement of words is not dependent upon grammatical rules, but simply upon rules of reason. As Richard Grant White says: "We have, in speaking or writing English, only to choose the right words and put them into the right places, respecting no laws but those of reason, conforming to no order but that of logic." In the few instances in which words are modified, a clear understanding of the relation, agreement or government to be expressed by an inflection, will insure the use of the correct inflection. A technical system of analysis and parsing will not banish bad grammar. The pupil must be required "to speak and write the language correctly;" in other words, the watchful care of the teacher must banish bad grammar from the speech of the pupil, and appropriate exercises must teach the pupil to write grammatically.

The structure of sentences is the subject matter of syntax. There are two methods—synthesis and analysis—of teaching the structure of sentences. Synthesis may, again, be taught: 1st. By the original formation of sentences on the part of the pupil. 2d. By requiring the pupil to complete a sentence by supplying some element purposely omitted. 3d. All the material or elements of a sentence being supplied, the pupil is simply required to arrange the elements in the order they should occupy in the sentence.

Experience has proved the small value of the last two kinds of synthetical exercises. All who have used, for instance, Quackenbos' *First Lessons in Composition*, or any similar work, will know that such exercises contribute little to correctness or facility either in grammar or in composition. These exercises have their value; they, together with analysis, teach the construction of the sentences submitted to the pupil. That the pupil should become acquainted with the construction and genius of his mother-tongue as exhibited in the classics of the language, we have already insisted upon in the beginning of this article. But it is one thing for the pupil to be able to analyze properly any sentence he finds written, or to supply some element omitted from a sentence, or to arrange in its

proper order, the material or elements of a sentence; and it is quite another thing for the pupil to express in writing clearly and properly a thought of his own. Yet to be able to do the last, is the ultimate aim of all instruction in language. If the pupil is able to express his thoughts, he will be in position to profit by the studying of the writings of others; but not before. It is a serious mistake, in point of discipline and of results, to require or even only to advise pupils to write a composition according to a specified model. The pupil will naturally trust and adapt his mode of composition to the model, and not to the subject as he views it according to the degree of his mental culture; and he treats the subject slavishly in the manner of the model, and not according to the method most natural to his powers and acquirements.

It may seem that we have turned aside from our immediate subject, Grammar, to its cognate subject, Composition. But as syntax treats of the structure of sentences, and as the clear and grammatical construction of sentences is about as much of composition as the great majority of pupils can hope to learn, syntax and composition may, for our purpose, be considered as nearly identical. For the teaching of composition proper is beyond the curriculum of the common school. If a pupil can express his ideas clearly and grammatically, we have gained a result far in advance of the usual result at present gained from instruction in grammar and composition. But in addition to this, it will be in the power of the teacher to give many a lesson in what may be more properly called composition, and the power of doing so will be commensurate with the literary and philosophical culture of the teacher. So, again, Prosody, or that part of Grammar treating of punctuation, utterance, figures and verification, can not form a distinctive study, connected with or independent of grammar and composition; it is one of the studies whose principles and facts must be taught incidentally, as occasion serves.

All formal instruction in grammar and composition is then to be confined to etymology and syntax. In speaking of these two branches, we have endeavored to draw attention to the *essentials* which ought to be taught, and to the technicalities which should be eschewed. We have also stated that the aim of all instruction in language is to endow the pupil with the

power of constructing a sentence clearly and grammatically. This power is to be acquired by the *original* formation of sentences, and not by the mere arranging of ready-made material into sentences, or by supplying some omitted portion of a sentence. All schemes which are not based upon original sentence making, present, in the words of Mr. Lauric, only "a specimen scheme of exercises so framed as to be capable of being mechanically performed by the pupil without a fair comprehension of the subject. Now, no conceivable device could be more ingeniously contrived to insure entirely fictitious and illusory results. An exercise is valuable, not immediately as a task to be perfunctorily gone through, but mediately as a practical proof that a given proposition or radical principle has been securely grasped."

We are in position now to give the scheme of instruction in grammar and composition which we hold to be the best, and which has therefore been adopted in outlining the Course of Studies. We divide the scheme into two parts, theoretical and practical, but premise that this division can be by no means strictly observed in the school-room or in outlining our scheme.

I. THEORETICAL.—Confined to etymology and syntax. 1. In the former, instruction to be confined to the parts of speech and a few modifications of them. The method to be pursued must be strictly to make the pupil first thoroughly acquainted with the office of the word, as the name of a person, place or thing; or as expressing a quality, an action or relation; or as connecting words, phrases, clauses or sentences. The reading lessons will furnish the only but abundant material. Great care must be taken to select proper exercises, that is such as present not too many difficulties of expression. The parts of speech should not be taken up in their usual order of article, noun, etc.; but it is best to take them in the order of noun, verb, adjective, adverb, pronoun, etc. After the offices of words can be distinctly analyzed, words may be classified into the parts of speech.

The tenses of the verbs must be taught by requiring the pupil to determine *the time* of the action predicated by the verb; words denoting action present, past and future, must be selected by the pupil from the reading lessons; the pupil may then be required to predicate action in time past, present and future.

The formation of the participles must be taught practically, *i. e.* by selecting examples in which the participle is or must be used. The agreement of the verb with its subject, in person and number, must also be taught practically, *i. e.* by requiring the pupil to predicate an action of the different persons, singular and plural; a second exercise will be the determining by the pupil, of the person and number of the subject of which a specified verb is predicated. All exercises should be confined to the indicative mood; but if any of the other moods is used by the pupil, the teacher must watch that the correct form of the verb is used. Technical lessons and exercises on the different moods, especially the subjunctive and potential, are, however, totally out of place. The pupil must first be able to state distinctly the time and state of the action—whether finished or taking place—expressed by the verb, before he is instructed in the technology of the tenses.

The formation of the plural and possessive cases, singular and plural, of nouns, must be taught practically, *i. e.* by requiring the pupil to write the plural of nouns, the singular of which is given. If thought advisable, the rules for the formation of the plural may then be deduced by the pupil. The classification of nouns into common and proper is of importance only from the fact that since proper nouns must commence with a capital, the pupil must be able to determine when a noun is common or proper. But as the pupil must learn to include under the definition of proper nouns the names of persons, places, nations, etc., he can just as easily be instructed, by practical examples, that all such nouns must begin with a capital. Certainly no more minute classification of nouns must be attempted. As nouns have no modification for person, the pupil need not be embarrassed with the determination of the person of nouns. The gender of a noun is, except in a comparatively small number of words, not indicated terminally; and besides, words related or agreeing or governed by the noun (if there are such in the English language) are not inflected by the gender of the noun, so that no formal instruction need be given in the genders of nouns. A few practical exercises are, however, not out of place to teach the pupil the formation of those feminine nouns which are formed by inflection, such as author, authoress; count, countess; instructor, instructress, etc.

No classification of adjectives is necessary. The class of proper adjectives merits recognition because these adjectives must begin with a capital; but here, as in the case of proper nouns, practical exercises will be of more importance than theoretical classifying. The comparison of adjectives must be introduced by requiring the pupil to learn from examples selected from the reading lessons, that when the comparative degree is used *two* objects or persons, etc., are compared, and one is declared to be *more* or *less* in some quality than the other compared with it; that when the superlative degree is used, we declare that of more than two objects or persons, etc., one is *most* or *least* in some quality. The formation of the degrees by suffixes or by adverbs, must in like manner be deduced from examples occurring in the reading lessons. Then the pupil may be required to write sentences in which adjectives must be compared; special attention must be paid that the pupil thoroughly learns that the comparative degree is used when *two* persons, etc., are compared, and the superlative when one object, etc., is most or least in some quality when compared with more than two objects, etc. The error of using both a suffix and an adverb in the same comparison must be pointed out when made by the pupil. The introduction of the technical names of the degrees of comparison must be deferred till the pupil thoroughly understands when and in what manner adjectives are compared.

The classification of adverbs is of no importance to the pupil; in learning the office of the adverb he will learn when an adverb expresses time, place, degree or manner. The *conjunctive adverbs* are the only ones whose determination will cause difficulties, and their determination may be safely omitted, for the aim of instruction in grammar is, not that the pupil may be enabled to parse every word that he may encounter in a reading lesson, but simply to become acquainted with those rules of grammar which will help him to arrange the words of a sentence in their proper order, and to use the correct form of such words as admit of modification by inflection. The use of *conjunctive* adverbs as conjunctions in connecting sentences, and as adverbs in expressing some circumstance of time, place, degree, or the like, can not be determined by the pupil until he has considerable knowledge, not only of grammar, but of com-

position and of logic. Adverbs are not modified, except that a few are compared; and the comparison of them must be taught in a like manner as the comparison of adjectives. Attention may profitably be drawn to the formation of adverbs from adjectives by the addition of *ly*.

In treating the article it is sufficient for the pupil to learn that "*an* or *a* is commonly used to denote individuals as *unknown*, or as not specially distinguished from others;" and that "*the* is commonly used to denote individuals as *known*, or as specially distinguished from others." The shortening of *an* into *a* before a consonant sound, can easily be deduced from examples in the reading lessons. The correct use of the article—when the definite or the indefinite is required, the repetition of the article before nouns joined in construction, etc., can only be acquired by practice and by the watchful care of the teacher to correct all errors in the use of articles.

The pronouns being so few in number; there being no distinction in person, except in the personal pronouns, no distinction in gender, except in the personal pronouns and in the relative and interrogative pronouns (in the use of *who* for *which* in the case of persons), and the distinction in number being very simple, the use of the proper class and case of the pronoun will occasion so little difficulty, except in the use of the objective for the nominative (and this most frequently in interrogative sentences by using *who* for *whom*), that all errors in the use of pronouns are more easily and thoroughly corrected by practice and the care of the teacher in correcting mistakes made in the speech and writings of the pupils than by technical grammatical analysis and parsing.

The use of the correct conjunction, the correct preposition, and the correct interjection, will depend upon practice, and very little upon skill in grammatical parsing.

In the July number of the TEACHER (page 16) we published an article on *Grammar* which will illustrate the method of teaching grammar by means of the reading lessons. The method indicated in said article must, however, be modified in many particulars in accordance with the suggestions and instructions herewith given.

JOHNNY LEARNS AN UNEXPECTED LESSON.

By Adam Stwin.

Johnny came home from his second visit to the Park Museum unusually sober and thoughtful.

He had been comparing pussy's feet with Humpty's, finding out a great many curious facts worth noticing; and his main errand to the park was to study the feet of the different animals there.

"Don't forget that you are to look at their eyes too," I said.

"All of them?"

"Certainly, if you have time. At least, look again at those you studied before."

Johnny wondered why it wouldn't be better to look at those he did not see before, and said as much. I simply assured him that it would very likely be worth his while to go over the old ground again, and so let the matter rest.

The truth is, I knew that a second looking would be pretty sure to show him some things that would surprise him. Since our last talk about eyes it had occurred to me that I had somehow let a number of very important exceptions to the general rule of cat's eyes slip my mind, and I wanted him to discover the mistake himself if he could.

I wonder if any of the little boys who read the account of our talk can tell what the mistake was.

"It's awful queer," said Johnny, when we left the supper-table.

I had suspected the cause of his trouble from the first, but had said nothing. To this last remark I simply replied:

"What is queer, Johnny?"

"Everything," he said; "cats and things—and cats' eyes. You said lions were cats, didn't you?"

"Certainly, lions are cats."

"And cats have eyes like pussy?"

"Most cats do."

"*Lions don't.*" This Johnny said with a sigh of relief, as though it were a comfort to get the troublesome fact off his mind.

"Are you sure?"

"Yes," said Johnny stoutly. "Fred held me up and I looked at them ever so long—both of them. The old lion looked straight at me with his eyes both open, and—he didn't have *cat*-eyes at all. Did he, Fred?"

"The pupils were perfectly round," Fred replied.

"So I was wrong when I said their eyes were like pussy's."

"It seems so," said Fred.

"That shows the difference between seeing and observing. I have looked at lions ever so many times, but never noticed their eyes particularly. So I said, at first thought, that they were as cats' eyes generally are—an error that Johnny was able to detect as soon as he really looked at a lion's eyes. I must have seen the fact stated in some book, for it occurred to me afterwards."

"And you didn't tell me!" Johnny exclaimed, with no little surprise.

"No, Johnny; if I had you would probably have forgotten the fact as I did. We are apt to have a very slight grip of things we learn in that way at second hand. Having discovered the truth yourself, I am quite sure you will never forget it.

"And it may teach you a much more important lesson," I added, seeing the unsettled and unhappy look his face was wearing."

"Lesson?" he echoed, with the faintest possible smile.

"Yes," I repeated, "a very important lesson, and that is never to be too sure of what you have not tested yourself."

"Not when *you* tell me?"

Poor fellow! The idea that I should tell him what was not exactly and wholly true had never entered his mind before. No wonder it made him feel bad.

"Everybody makes mistakes," I replied; "and those who would not tell you a lie for all the world may tell you what is untrue, as I did, when they least intend it. It's a sorry lesson to learn, but we all have to learn it sooner or later. Without doubting people's honesty in the least, it is a good plan always to test, so far as we can, what they tell us, in books or otherwise, by our own observation and thinking. That is the only way to be sure of what we know."

"We can't always be sure we are right even then," Fred remarked, with a laugh.

"Not always, for we may reason wrongly as well as others; and sometimes we let our senses deceive us, or more correctly, perhaps, we misinterpret what our senses tell us. We have our mind so fully made up in regard to what we look at that we see what we expect to see, when the fact is really something else. Still, as a rule, there is a special value to the knowledge we get by our own efforts; and if we make a habit of being careful in our own observations and inferences, and are not too sure of what we do not actually know, we are not very likely to go far wrong."

"I suppose I was hasty," Fred remarked, "the first time we looked at the tiger's eyes. We had been looking at the wild cats in the cage below the tigers'. I knew the tigers were cats, too; and, though we couldn't see their eyes very well, I was sure the pupils were narrow like pussy's. To-day the sun was not so bright; the tigers opened their eyes wider, so that I could see the whole of the pupil, and it was"—

"Just like the lion's, only bigger," Johnny chimed in, glad the talk had come once more within his reach.

"It is wonderful," Fred continued; "the tiger's expression is so cat-like, especially about the eyes, that one would not expect the eyes to be so different."

"I suppose his round face and his stealthy look through half-shut lids, so like pussy's, help to make us think him more like pussy than he really is."

"It is a noteworthy fact, that of the multitude of animals of the cat-kind, only the largest have round pupils, and these vary most from the common type. Of the leopards, which are least cat-like, the cheetahs, or hunting leopards, vary from the type so much that for a long time it was undecided whether to class them with cats or not."

"Do they differ except in their eyes?" Fred asked.

"Very much. You remember how pussy's feet are, don't you, Johnny?"

"'Course I do!" said Johnny, brightening up again. "She has sharp claws."

"Anything more?"

"She draws 'em in and sticks 'em out when she wants to. The old tiger did just the same when he waked up and stretched himself. I saw him."

"Are Humpty's feet like that?"

"No," said Johnny. "His toes have dull claws, and he can't draw them back. That's why they rattle so when he runs on the bare floor."

"Could he catch a rat with his paws as pussy does a mouse?"

"No. He bites 'em," said Johnny, "and shakes 'em. He can't hold anything except with his teeth."

"That's the way, I believe, with the cheetah. He is a cat in most respects, but he has dog feet as well as dog eyes."

"And he looks a good deal like a dog—a coach dog," Fred added. "I have read of their being used like dogs in hunting."

"So they are, I believe," said I. "Maybe their round-pupiled eyes have something to do with their dog-like manner of running down their game. It would be interesting to study the habits of all the dog-eyed cats from this point of view, comparing them with the habits of the more numerous species that have eyes like pussy.

"But poor Johnny is dropping off to sleep, tired out with so much talk that is too old for him. I'm afraid he'll dream of monster cats to-night. Suppose you call Mary to put him to bed."

"How many cats have round pupils, anyway?" Fred asked, when Johnny had bidden us a sleepy good-night.

"Four kinds, I believe—the lion, the tiger, the leopard and the jaguar. At least, these are all that I have seen, and all that are mentioned by Prof. Owen, the first to notice these exceptions. Very likely they are all, for his knowledge of animals is very extensive, and he is pretty careful in what he says.—*Christian Union.*

IOWA erected 1,266 school-houses last year.

A member of the Springfield Mass. School Committee recently said: "Them teachers ought to be examined; they shan't have no vote of mine unless they be."

THE salary of the Superintendent of the Stockton public schools is fixed at $900 per annum.

THERE are 2,881 children in the Oakland public schools. Up to this term the largest number ever enrolled was 2,500.

THE election in Lakeport on a proposition to raise $500 for school purposes, resulted in a unanimous vote for the tax.

THERE are now 244 students in attendance at the State Normal School, at San Jose, the largest number ever enrolled at any one time.

DEPARTMENT OF PUBLIC INSTRUCTION.

EXAMINATION OF TEACHERS.

We are pleased to notice that the manner of determining the qualifications of applicants for position as teachers receives just at present some of the attention which its importance demands. Attention seems to have been drawn to the matter on account of defects in our present system of examining teachers. Defects in this system are discovered at the close of every quarterly examination, and generally by the friends of the applicants who fail to obtain certificates. We are sorry to see that it is not yet more generally recognized that the whole system of examining teachers is one vast defect in our educational system; and that to cure the evils of which complaints are made, we must lay the axe at the very root of the tree. Instead of doing this, however, the evils are generally ascribed to the actions of the Boards of Examination; and the State Board has been more frequently and liberally libelled—for this is the correct term to be used—in this matter than any other Board. Most noticeably has this been done by Superintendent Kennedy of Santa Clara County, in his opening address before the Teachers' Institute lately held in that county. We quote from his address as follows:

"Comments have been made quite freely upon the results obtained by teachers' examinations. Questions have been pronounced mere conundrums. Boards of examination have been handled quite severely for the manner in which these examinations were conducted. Some of these criticisms were called forth by an honest desire to do good, while others were mere personal attacks on the members of the Board to satisfy some personal spite. Our present system of examinations is supposed to be the result of years of experience. Yet it does not meet the wants of the times. It is not a true test of the ability to teach, because many fail who have proven themselves good capable teachers, and many are successful whose only qualification is the ability to answer correctly a stated number of questions. It is true that one should know what he teaches, yet there are other qualifications just as necessary. He should know how to teach what he knows. He should possess the faculty of maintaining good order. He should have good use of the English language. Now our present mode of examination is not calculated to determine all these points. It may determine the scholarship, and even this is doubtful, but it must leave the examiner in total ignorance of the applicant's other qualifications. His ability to teach can only be determined by the examiner after he has heard him explain his methods of teaching the different branches of study. In many examinations there will be cases like the following: of two applicants, one will make 80 per cent., but in his answers there will be mixed up 15 per cent. of errors, and the most ridiculous nonsense imaginable. The papers handed in show clearly the vague, indefinite scholar. The other reaches from 75 to 78 per cent., but his answers are clear, practical and to the point. He attempts to answer only what he knows. His papers show a practical scholar, having clear, definite ideas. The former receives a certificate, while the latter, if the strict rules of the examination be adhered to, is pronounced unfit to teach school. If the rules are ignored and the applicant granted a certificate, and his papers sent to the State Board for the purpose of obtaining a State certificate of like grade, the result is that County Boards are accused of being incompetent for their work. I do not suppose that the State Board of Examination have the least desire to do anything but what is just. Yet there seems to be a vast amount of unnecessary criticism. There is hardly an issue of the CALIFORNIA TEACHER but contains a great many contemptible insinuations in reference to County Boards. The State Board have no means of knowing the character of the applicant, but by the recommendation of the County Boards. Hence their recommendations deserve gentlemanly consideration. To show how unsatisfactory our examinations are, I will give an example: a gentleman of superior scholarship, long experience in teaching, passed the examination for the purpose of obtaining a

State Certificate. At one time for many years he was principal of a High School. For many years he was Professor of Mathematics in an Eastern college. At another time he was teacher of Greek and Latin in an academy. All of these positions he filled with ability. Previous to the examination, however, he had not been teaching for four or five years. This gentleman applied for a First Grade certificate. In all of the principal studies he stood very high, over 90 per cent. But in School Law, and some of the less important branches, he was quite low, which reduced his percentage to 84. The facts of his ability were well attested to by letters, and the County Board very properly gave him the desired certificate. The papers were sent to the State Board of Examination, the facts of the case set forth, and it was recommended that he be granted a First Grade State certificate. When the papers were heard from, the gentleman received a Second Grade certificate. Had this been their universal custom no one could complain. About two weeks previous to this examination another person applied to the State Board for a certificate. He refused to stand an examination because he knew he would fail. He had not graduated from any Normal School. He never occupied the position of City or County Superintendent. He held no certificate. Yet the State Board granted this applicant a First Grade certificate in the face of all these facts. Comment is unnecessary. Let the facts speak for themselves. Surely it cannot be possible that a system that produces such blunders as these can be the true method of testing the ability of teachers. I would suggest that the State Board have some fixed rule for granting certificates, so that all may be treated alike. There should be both written and oral examinations in each branch, half the credits being given for each. By the oral examinations Boards are enabled to tell whether applicants are qualified to explain clearly the subjects which they are expected to teach. This method would better enable examiners to determine all the qualifications necessary for a good teacher. It would give Boards more discretionary power, and thus better insure justice to all concerned. It would raise the standard of scholarship, and insure us better teachers, by giving us a more correct mode of examining."

As a preliminary we must correct two statements which Superintendent Kennedy has made. First, in regard to his remark that "there is hardly an issue of the CALIFORNIA TEACHER but contains a great many contemptible insinuations in reference to County Boards." Excluding this number of the TEACHER, the present management has published *twenty-eight* numbers. In these twenty-eight numbers instructions were issued to County Boards in only *nine* numbers, and in every case the instructions referred exclusively—and without a single word of comment upon the actions or proceedings of any County Board—to the powers of the Boards, the manner of forwarding examination papers to the State Board, etc. The following are the nine numbers we refer to: December, 1872; February, 1873; June, 1873; September, 1873; January, 1874; February, 1874; May, 1874; July, 1874, and September, 1874. Only in this last number did we write something which might sound "insinuating."

How justified we should be to repeat the "insinuations" may be seen from the fact that in spite of them over *seventy-five* incomplete sets of papers of the last examination were received at this department; and such inexcusable carelessness on the part of several County Superintendents caused the State Board of Examination serious inconvenience and loss of valuable time. The instruction that "it would not be amiss to exact correct orthography, and some semblance of having studied grammar and composition," we can only repeat, for these matters are persistently ignored in the great majority of cases; that is, a majority of the County Boards of Examination permit to pass unrebuked the large percentage of errors and "the most ridiculous nonsense imaginable," which occur in so many examination papers, and of which Superintendent Kennedy so justly complains;

and we wish to assure Mr. Kennedy that the State Board always deducts the requisite number of credits for these errors and "ridiculous nonsense," and that no candidate as instanced by him in his first case receives a State certificate. We do not deny, however, but that we are fully justified to charge quite a number of County Boards of Examination, not only with incompetency, but also with dishonesty; but the present occasion does not permit us to do so. At a future time we may, however, revert to this subject.

The second statement to which we desire to reply specifically is, that the State Board granted a certificate to a person who refused to stand an examination because he knew he would fail, and who had not graduated from any Normal School; who had not held the position of City or County Superintendent, and who held no certificate. By implication the charge seems to be that this person received a certificate without being legally entitled to it. We deny emphatically that any such certificate has ever been granted by the present State Board of Examination. Since April 1, 1874, the State Board can grant and does grant certificates only upon State Normal School Diplomas, upon Life Diplomas, or upon examinations. From January 1st, 1873, to April 1st, 1874, Section 1750 of the Political Code authorized the State Board that "when any applicant presented to the State Board of Examination certificates or other evidence of a public nature, conclusive of his fitness to teach all the branches of the higher grades, to grant, by a unanimous vote, to such applicant a First Grade Certificate." Under this provision of Section 1750 quite a number of certificates were granted, *but in no case except diplomas or certificates were presented, and satisfactory proof that the holder had taught successfully.* If the gentleman of superior scholarship, long experience in teaching, etc., of whose ill-treatment at the hands of the State Board Mr. Kennedy complains, had presented such diplomas, certificates and evidences of success in teaching, the State Board would have granted him a State Certificate without an examination. But as the gentleman chose to rest his claims upon an examination, his claims had to be determined exclusively by the results of such examination. From a review of the papers we find that the failure of the gentleman to obtain a First Grade State Certificate, after obtaining a First Grade County Certificate, resulted from the fact that in arithmetic, geography and grammar, in which the County Board had marked the applicant perfect, the State Board found him to be entitled to only 70, 94, and 77 credits respectively. The recommendation of the County Board that a First Grade State Certificate be granted, *could* not be considered, for the law explicitly makes the grade of the certificate dependent upon the results of the examination. The recommendation of County Boards are largely, almost exclusively, relied upon, however, in the granting of Educational and Life Diplomas, the only cases in which such recommendation can be considered by the State Board.

That teachers must be possessed of certain qualifications fitting them for their peculiar work, is universally acknowledged. Educators—in and out of the profession—have fully determined the nature of these qualifications, and they have also fully determined the means by which these qualifications may be secured. But these investigations have borne very indifferent fruit in school legislation. Taking our own State as an example, we find that the only qualifications exacted of teachers are the ability to pass an examination in certain specified studies, and to produce evidence of good moral character. Nowhere in the law is it provided,

however, that the applicant must produce *evidence of fitness to teach;* and yet such fitness is as necessary as scholarship. How the State Board has tried to remedy this defect of the law will appear *infra*.

The studies in which an applicant must be examined are prescribed by law, and no authority short of the Legislature can excuse an applicant from being not examined in all of the studies. That among these studies are some which ought to be excluded, we shall not deny. We succeeded in inducing the Legislature of 1871–2 to drop some of the studies, such as School Law, etc., but the last Legislature, against our judgment, again inserted these studies into the law. The State Board has, however, since December 1st, 1871, reduced the maximum of these objectionable studies fully one half, so as to prevent as much as possible the reduction of the standing of any applicant who, while standing very high in all of the principal studies, may yet stand very low in School Law and some of the less important branches. As a further safeguard the State Board raised the credits to be allowed in two of the more important branches—arithmetic and grammar—one fourth. If in spite of this an applicant fails because, while standing high in the more important branches, he stands low in the less important branches, the law is responsible for this, and not the State or County Board of Examination. For to ignore these less important studies would subject the Board doing so to the penalties prescribed in Section 1872 of the Political Code.

The nature of an examination is determined by the questions prepared by the State Board of Examination, as it is the duty of this Board to prepare all questions to be used in the examinations held by the State Board and the different County and City Boards. Now the State Board can select only questions purely technical in their nature, or purely professional, or both technical and professional. By technical questions we mean such questions as will test the *knowledge* of the examinee; by professional questions, those which will test the teaching capacity of the examinee. Common sense will tell us that questions which test both the knowledge and the teaching capacity of the examinee should be devised, for a teacher should possess both knowledge and professional capacity. The absence of either unfits him for his profession. The State Board has always tried to prepare questions which are at once technical and professional, as far as the nature of the study would allow this. In a majority of studies this can be done only very indirectly and approximately by framing such questions which, while testing the knowledge of the examinee, would show by his answers the order of his thoughts and the manner of presenting them. The clearness or vagueness of the thought, the degree of philosophical connection between the separate thoughts, will depend upon the accuracy of the examinee's knowledge and his mental culture. In studies in which it is practicable, as for instance in arithmetic, algebra, natural philosophy, etc., the examinee is distinctly instructed to present his subject in the manner he would adopt in teaching it to a class. Thus in arithmetic the instructions are that "no credits are to be allowed unless the answers are correct and the work is given in full, and, when possible, such explanations as would be required of a teacher in instructing a class; a rule is not an explanation." In natural philosophy the questions are taken from the most elementary work published on the subject, and which confines itself to the phenomena daily and commonly observed, and the explanation of whose causes will not be beyond the capacity of the dullest scholar, if the

teacher uses the proper means of instruction. The instructions to the examinee in this branch are that "the familiar facts and experiments required to be cited in answering the questions are such, and only such, as would be used by a teacher in illustrating or proving the phenomenon to a class of pupils. No credits are to be allowed, no matter how correct the answer, if the familiar facts and experiments are omitted or not to the point." It will be seen that the State Board of Examination has done its utmost to make the examination of teachers what it should be. The Board aims to frame such questions only as will test the technical and pedagogical knowledge of the examinee. But from the former are excluded as much as possible all facts which can only be memorized and not organized into knowledge proper, such as dates in history, the names of places, bays, capes, etc., with which our geographies are usually crowded, etc.

How can we determine the results of an examination? In crediting the questions which are both technical and pedagogical, we can allow so much for correctness in either branch. But in studies in which such questions can not be asked—and this is the case in a majority of the studies prescribed by law—can not the candidate demand that his credits must depend upon the correctness of the answer, irrespective of the shape in which it is given? If we are to deduct for bad grammar, bad composition, incorrect orthography, and general inaccuracy of thought, would not more than three fourths of our applicants be unsuccessful? And by what standard are we to determine the degree of badness of the grammar, composition and presentation of the subject, in short the unfitness of the applicant to teach? Only the general rule can hold good, that the technical portion of an applicant's work will be judged more strictly or leniently according to the clearness, definiteness and accuracy of the language he uses. This rule has been adopted not only by the State Board, but by very many of the County Boards. But this rule is so difficult of application that an applicant will frequently be able, and with some show of justice, to demur to the markings of the Board; and the cases are not few, in which a County Board has seen itself compelled to grant a certificate when the Board was convinced that the examinee was not worthy of it.

The selection of questions, irrespective of their nature as technical or professional, is involved in great difficulties. If a question is strictly within a text-book, the cry of "pedantry" is raised; is the question one which every intelligent man ought to be able to answer, the applicant complains that the question is outside of the text-book. Such questions as relate to mental philosophy—the professional study as Northrop calls it, and the study without which "teaching never can and never ought to rise to the dignity of a profession"—though the first questions which should be asked, are the most bewildering of all to applicants. We prate about the ultimate end of education consisting in the development of the faculties and powers of the mind; yet to require teachers to know what the powers and faculties of the mind are, and how they may be developed, is an assumption of pedantry on the part of the examining Board which has raised the ire and ridicule of many newspapers, as well as of the applicants and their friends.

But to come to the real point at issue, it is this: the practical difficulties are so many, that it is impossible to devise any system of examination which will ensure the competency of all persons who obtain certificates. The law itself presents serious difficulties in limiting the examination to the mere answering of questions

in the studies to be taught in school. Candidates and their friends will always demand that an examination be judged according to the technical correctness of the answers; and they will object to all questions which the applicant is incompetent to answer. Then the time which is at the disposal of the examining Board is far too short to permit of even an approximately thorough examination. But the more serious objection to all examinations is the fact that as the examination is provided for those only who have not properly prepared themselves for the profession by passing through a Normal School, we have as applicants the girl not yet out of short clothes, the boy who but yesterday played marbles, the student of law, medicine or theology, who desires to replenish his purse by a term of teaching; the stranded minister, lawyer, doctor, in fact any one with a common school education who has failed in every other direction. And all expect to be admitted to the profession by the simple answering of a set of questions. Hence it is not to be wondered at that so many incompetent persons creep into the profession. But the blame must not be laid at the door of the examining Board; the whole system of examination alone is responsible. That this is the case may be seen from the fact that the defects of the examination system, and the resulting evils, are not local, but general throughout the United States wherever the system has been introduced.

"Teaching is an *art* to be learned by apprenticeship, like any other art, and the special training for the business of teaching is as indispensable as for any other pursuit or profession; and the time, it is believed, is not very distant when intelligent parents would think it no less absurd to place their children in charge of a teacher who had not been trained in the principles and methods of instruction, than to employ a surgeon who has never made himself acquainted with the science of human anatomy." In the language of the gifted Edward Everett: "If the teacher was to fashion your child's personal proportions, or to remodel his features, with what jealousy would you inquire after his qualifications for that task? Is it of less importance how he fashions and moulds the features of the mind? The husbandman can tell us if it is a matter of little or no consequence whether you employ a skillful or unskillful person to raise a crop of corn, the growth of a few months, under a simple process of culture. Every man's reflection and experience will satisfy him that the teacher's duty is important, complicated, and arduous. It is not a mere piece of job-work to which any one can turn his hand, but a professional calling, which requires knowledge, judgment, and experience."

EDITORIAL DEPARTMENT.

THROUGH an oversight, we neglected to credit to the *New York State Educational Journal* the article *On Titles* appearing in last month's TEACHER.

IN September we paid a flying visit to the State University at Berkeley. After examining and admiring the Students' Club Houses, and noting the private buildings rising up all around the University Grounds, we turned to the west side of the Grounds, the only place besides the printing office and the nearly finished cottages, where we could discover any signs of life. But here all was activity; and it was some time before we could discern through the dust and confusion raised by shoveling men, soil-hauling and grading teams, our friend, Mr. John

Ellis, the practical gardener in charge of the Agricultural and Horticultural Farm. With him as our guide we examined the improvements already made, and from him we learned some of the plans proposed for making the Farm, what it should be, the place where the student may organize into a practical art, the science which he learns in the laboratory and lecture halls of the University. The grounds selected for the farm, comprise some sixty acres, to which more will be added as needed. A very fine looking and economically constructed barn, thirty-six by forty-six feet, is already erected. Connecting buildings will be built as soon as the conditions of the farm require them. In the horticultural department of the farm we found a cosy little nursery, for raising trees, shrubs and flowers, to be used in planting the grounds when laid out, and for exchange. The green-houses, plain but neat structures, are two in number; one is twenty by thirty feet, the other sixty-three by fifteen feet; connected with them is a potting shed, a seedroom and office, a dormitory, a shed for pots and another for compost. All these buildings, except one of the greenhouses, were erected by the gardener and his working force, with the occasional help of a single carpenter. The gardener has also laid some five thousand feet of water pipes for irrigating the nursery, grounds and farm. In the nursery we found already some hundreds of plants growing in small pots, and hundreds more ready to be potted; one greenhouse was devoted to the sprouting of seeds.

The agricultural students having become theoretically acquainted with the constituents of plants and soils, the necessity of soils containing these constituent elements, and the means by which a deficiency or absence of any of them may be remedied—will be given full opportunity of gaining, by actual work and observation on the farm, a thorough knowledge of the general routine of agriculture, and more especially of the capacity of soils in the production of the various kinds of vegetation, and of the mechanical conditions of soil best adapted for the crops proposed to be cultivated. In this connection the various systems of "rotation cropping" will be tested; the value as fertilizers of "green crops" plowed under; the various grasses and cereals will be grown, their feeding, fattening, milk-giving qualities, etc., adaptability to climate, production to the acre, etc., will be carefully observed and noted. A portion of the farm will be devoted to the cultivation of the vegetables adapted for culinary use and for feeding stock. The principal medicinal plants and the plants of general domestic utility will also be grown.

This fall an extensive orchard of fruit-trees and small fruits will be planted, comprising the apple, pear, peach, nectarine, plum, apricot, cherry, fig, grape, gooseberry, currant, strawberry, raspberry, blackberry, almond and nuts of various kinds. It is intended to make this part of the farm of vast importance to the whole State, by rectifying and determining the nomenclature of fruits, by determining their seasons of maturing, their qualities and how modified by climatic influences. The fruits will be exhibited for public inspection. Scions of the fruit trees will be freely distributed throughout the State in order to test old or new varieties in the different sections, and to note variations resulting from changes in climate. Fruits will be correctly named for any person making application. The noting and comparing of the botanical differences of the trees and fruits growing on the grounds will lay the foundation for a great deal of practical botanical knowledge necessary to the agriculturist and horticulturist; and

students will be trained to pay special attention to the difference in the wood and foliage of the various species and varieties, so that in a short time a variety can be as easily recognized by its wood and foliage as by its fruit.

The practical development of the agricultural department of our University is thus fully insured; and we think, when the plans above indicated are fully matured and executed, the requirements of the agricultural community will be fully satisfied.

WE frequently notice in our exchanges items which show how much misapprehension there exists on school matters. The matter of examining teachers receives the greatest share of attention, and on this subject the itemizers take the least pains to be informed. The following item, clipped from an exchange, will illustrate our point:

"The list of questions submitted to the teachers is a very severe one, and only those who have received a collegiate education can pass the examination so as even to get a third class certificate, if the examination is conducted strictly according to the law. Our Superintendents are obliged to construe the law liberally or we would have no teachers in our schools. No account whatever is taken of the experience of the teacher. He must answer 85 per cent. of the most difficult questions in eighteen branches, including penmanship and music, in order to obtain even a Third Grade certificate."

The facts in the case are, that sixty per cent. is the minimum for a Third Grade County certificate; eighty-five, which is stated to be the minimum for even a Third Grade certificate, is, in fact, the minimum for a First Grade State Certificate. About the severity of the examinations we submit, that the severest examination lately held was upon questions the majority of which were selected *verbatim et literatim* from an examination for promotion of a second grade grammar school class! If candidates and their friends desire to convince themselves of the elementary character of our examinations, they need to examine only the questions submitted to the different grades of pupils on examination for promotion. Our experience is that the more elementary a question, the more certain and lamentable the failure of the average applicant. The reason is not far to seek. The Examining Board of the West Point Military Academy has tersely stated it to be the "want of thoroughness in the schools of the country with respect to their primary work."

In regard to the collegiate character of the studies or the questions in which an applicant must be examined, we simply refer to the examinations of teachers in other States and countries. "Penmanship and music" being honored by special mention as two of the eighteen branches in which an applicant must be examined, seem to be considered as pre-eminently difficult studies, and proficiency in which depends upon collegiate education.

Superintendent Philbrick of Boston, says: "'All roads lead to Rome;' so all lines of educational improvement converge to one central object—*the teacher*. The importance of other elements that go to make up a good school may be and often are over estimated. Not so with the teacher. The teacher *is* the school. How to secure a teacher who understands and loves his work—this is the educational problem at all times and in every place. It is a comparatively easy matter to build good school houses and make a judicious choice of text-books, and draw up a rational and sound scheme of instruction; but to furnish such teachers as are needed is a very different thing."

The question is, not whether our system of examining teachers is such that a majority of the applicants may obtain certificates, but whether the system secures to our schools no persons but who are *teachers*. The capacity of our present system in this respect forms the subject of an article on the "Need of Trained Teachers," in the State Superintendent's last Biennial Report. We commend this article to the attention of all who are interested in the condition of the teaching profession.

IT is difficult to determine what is really expected of an examination. Thus we notice in the editorial of an educational exchange the following: "We can not refrain from expressing disapprobation of the mistaken principle involved in the present method of arriving at *qualifications* rather than *capacities* of applicants." If such is the opinion of a teacher of considerable experience, what can we expect of non-professionals? But this extract, nonsensical as it is, seems to express the popular test of all examinations. Public opinion demands an acquiescence in the doctrine that an applicant's fitness for teaching must be determined before he can be permitted to assume charge of a school. Yet if an examination shows the applicant's want of *qualifications*—that is deficiency in knowledge, or in professional skill, or in both, for *qualifications* can mean nothing else—the clamor is that the examination is not just—is too technical—for the applicant has undoubtedly all the *capacities* of a teacher, that is all the capacities of acquiring the knowledge and professional skill demanded of a teacher. We suspect that a large number of teachers obtain entrance into the profession on assumed *capacities* rather than on proved *qualifications*. The results are patent to all observers.

IF the needed qualifications of country teachers are compared with those of city teachers, it will be found that the popular, and even professional opinion, is that the qualifications of a teacher should be in direct ratio to the size of the class to be taught, and *not*, as in fact it should be, in direct ratio to the number of grades or divisions represented in the class. In fact it takes a better qualified teacher for the smallest country school than for the largest class in a graded city school; the reverse is the popular opinion and practice. Then again, the popular opinion holds that the qualifications of a teacher should be in direct ratio to the age of the pupils; the reverse should be the case. It takes more *capacity* for teaching a primary class than a college class; and though the qualifications are not the same in both cases, yet in the case of the primary class is demanded the highest degree of the organization of these qualifications into the art of teaching.

The causes for this popular estimate of the qualifications of teachers, are obvious. The acquisition of knowledge is held to be the only object of education. The knowledge whose acquisition is desirable is represented by certain text books. The mastery of these text books is therefore all that is expected of the pupil. As the text books present the quantity and quality of the material to be learned by the pupil, and also the method according to which the pupil is to learn, people are very lenient in judging of teachers who fail to pass a satisfactory examinations. For can not any deficiency in knowledge and professional skill be easily supplied by a little after-studying of the text books? But as soon as parents fully realize that the acquisition of knowledge is dependent on mental activity, and that this mental activity can not be excited except the teacher works

with the pupil, and not merely hears recitations, we shall see the text book relegated to its legitimate place—the library. And then we shall find parents demand qualification and experience of the teacher as well as of the shoemaker.

The qualifications will then not be limited to the ability of merely answering a number of questions in certain specified studies; and the work of the teacher will not be gauged by his ability in teaching the contents of the text book; and the pupil's progress will not be measured by his proficiency in repeating the jargon of the text book.

EDUCATIONAL ITEMS.

CALIFORNIA.

CHICO is building a $20,000 school house.

IN Santa Barbara county there are fifteen schools, in which there are enrolled 990 pupils.

THE present term of the State Normal School, the first of the school year, closed October 25th, when a vacation of about one week began.

TWO attempts of the people of Eureka school district, Yolo county, to vote a tax to build a decent school-house have been defeated, the elections having been adjudged to be illegal.

THE School of Design in San Francisco is entering upon its new term with excellent prospects. The attendance has already reached fifty-five. A majority of the pupils are ladies.

PROFESSOR HILGARD, of Michigan University, who temporarily supplied the chair of Agriculture at the University after Professor Carr's removal, has been invited to fill it permanently by the Board of Regents.

AT the late examination of teachers in Nevada county, Misses Laura and Sadie Booth, both colored, were awarded Third Grade certificates. Their education has been obtained exclusively at the colored school in Nevada.

MAINE is beginning to walk rapidly in education. Lewiston is getting the Kindergarten system in the primary schools, and several ladies have been chosen in the different parts of the State to serve as School Supervisors.

UNDER authority of the Board of Regents of the State University, Hoffman & Craven have just issued a new edition of the map of California and Nevada, by the State Geological Survey. The map has been thoroughly revised.

STATE SCHOOL TAX.—Last year the State School tax for school purposes amounted to $240,000. This year it will be $1,110,000. The State Fund for public schools is almost half the expense of our whole State Government.

THE school-house at Durham Mills, Butte county, was recently destroyed by fire. The fire caught from a defective stovepipe, in the roof above the ceiling, and the school continued in session until neighbors nearly a mile distant arrived and gave the alarm.

THERE is trouble in Dixon about the admission of colored children into the public schools. The Trustees originally voted for their admission, but owing to the unpopularity of the order it was rescinded, and now the colored children are taught after regular school hours.

IN 1866 there were twelve school districts in Los Angeles county, and now there are forty-five. In 1866 there were only 2,504 children in the whole county between five and fifteen years of age; this year there are 7,066 between five and seventeen years of age; and in Los Angeles alone there are 2,411 school children.

SAN JOSE AND SANTA CLARA are rapidly overtaking Oakland in the number and excellence of their colleges and schools. The Santa Clara College, the University of the Pacific, the San Jose Institute and Business College, the College of Notre Dame for young ladies, the State Normal School, together with a score or more of excellent public schools, the *Mercury* thinks ought to be sufficient to suit all tastes.

A DRAWING SCHOOL FOR TEACHERS.—Drawing classes for the instruction of teachers who teach drawing in their respective classes in the public schools has been organized in the South Cosmopolitan School building, corner of Bush and Stockton streets. These classes were organized under a resolution of the Board of Education, adopted a few weeks since. The intention is to only keep these classes formed for a few months, as it is expected the teachers can in that time learn sufficient of the rudiments of drawing to instruct their classes intelligently. Teachers of junior classes in the high schools, and of the first, second and third grades in the grammar schools, will meet every Monday afternoon at three o'clock; teachers of fourth and fifth grades on Tuesday; teachers of sixth grades on Wednesday; teachers of seventh grades on Thursday, and teachers of the eighth grades on Friday; all at the same hour—three o'clock in the afternoon.

A SEPARATE SCHOOL CASE DECIDED.—A school case of considerable importance has lately been decided by the Supreme Court of Illinois. As it is of a character to interest School Directors in this State we give the following abstract of it:

It seems that the directors of a certain school district resolved to build a school-house for the accomodation of four colored children residing in the district. Two of these refused to attend. A teacher was provided for the two that did attend, but some of the residents of the district, looking at the thing in hardly a contented light, prayed the Court for an injunction against such a misappropriation of the public funds, and the case being carried up the judgment was made perpetual. Thus ended the separate-school experiment in Illinois, as the opinion of the Court was sweeping in its terms, and will block all further attempts at the separate system.

MUNIFICENT GIFT TO THE UNIVERSITY OF CALIFORNIA.—The Regents of the University have resently taken steps for the organization of a department of mining engineering, and have appointed as Professor Mr. William Ashburner, one of the most experienced and learned mining engineers of this State.

The interest in this department will be quickened by an announcement which we are now able to make. It has been well known to miners and metallurgists, and also to scientific men of the coast, that H. G. Hanks has made a valuable, and in some respects, an extraordinary collection of minerals, forming perhaps the most complete cabinet of the kind.

James D. Keene, of the Board of Brokers, on Saturday purchased this great collection, the value of which is estimated at $7,000, and has presented it to the University. His generous action will be greatly appreciated not only by the authorities of the University, but by all who are interested in scientific studies and the development of mining industry.

We have reason to think that this collection will be soon increased by another liberal gift. The University Museum, thus made up from the Geological Survey, the Pioche Cabinet, the Mills Cabinet, and the Keene Cabinet, will soon be one of the most extraordinary in the country.

OTHER STATES.

A feminine student took the scientific honors at the Indiana State University this year.

THERE are 140,000 saloons in the country, against 128,000 schools and 54,000 churches.

THE Ohio Constitutional Convention has adopted an article permitting women to hold any school office except State Commissioner.

THE pupils of the Dover, N. H., High School are examined at regular intervals on topics which involve a careful reading of the daily and weekly newspapers.

THE State University of Missouri, imitating Harvard, proposes to open its doors to teachers for a course of a few weeks' instruction, especially in the natural sciences.

A district schoolmaster in one of the upper counties of Michigan was asked what algebra he preferred: "Oh, I ain't particular—most any kind that will just peel the hide when you strike."

AT the Young Ladies Seminary in Hartford, prizes were recently offered for the best loaves of bread, to be made by the students. Four matrons and the Professors of Chemistry were the committee, and seven young girls won prizes.

TWO young ladies have applied for admission to the School of Theology, Boston University. As they are properly qualified and recommended they will be admitted. One is from Ohio and the other from Massachusetts. Both are Congregationalists.

THE full bench of the Supreme Court of Massachusetts has decided that the School Committee Board is the sole judge of its own membership. This decision sustains the Boston School Board in refusing seats to women, and the latter must go to the Legislature to obtain that privilege.

BOOK NOTICES.

ANALYSIS, PARSING AND COMPOSITION. Designed for beginners. By G. E. Lighthall, Teacher. Published by A. Waldteufel, Music Hall, 278 First street, San Jose, Cal.

The author's endeavor is to simplify the study of Grammar. His attempt may be called a success, when compared with a great many others who attempted the same thing. He begins properly his work with the simple sentence as the unit of thought. The whole work contains but 74 pages, and yet it may be called complete as far as analysis is concerned.

Although Dr. C. F. Becker, the originator of this system, published his first work in 1824, and his commentaries and organism of language soon afterward, yet up to the present day, we have failed to see simplicity and clearness of logical reasoning applied to grammars designed for use in our common schools.

By the highest educational authorities grammar is regarded as the logic of the school-room—and we may safely assert that whenever this feature of logical reasoning is wanting in this study, we may as well dispense with it altogether.

We sincerely hope the author may be called upon to give us a second and revised edition of this little work, which we regard as a proper step in the right direction to force our schools from that useless verbiage, improperly called the study of Grammar.

THE GOLDEN STATE AND ITS RESOURCES. By John J. Powell. San Francisco: For sale at all the book stores. 1874.

How well Mr. Powell is qualified for the task he has undertaken may be illustrated by the following passages: "The Cedar, in common with all the Pine family, is exceptional in organization." "They reveal a new idea of the Creative mind." "They do not belong to either of the two great divisions of the vegetable kingdom. They are neither *Phanerogamous*, or flowering plants, nor *Cryptogamous*, or flowerless plants."

A SCHOOL HISTORY OF GERMANY: from the Earliest Period to the Establishment of the German Empire in 1871. With one hundred and twelve illustrations and six historical maps. By Bayard Taylor. New York: D. Appleton & Co., 1874. 608 pp.

If our memory serves us right, this is the first attempt to present to the American public a school history of Germany. The very fact, that there never existed a German nation in the usually accepted sense of the word, but simply a Germanic race, divided into many tribes, gradually developing into independent states, ruled by sovereign princes—makes the writing of a history of Germany a most complicated task. If any one is fitted for such an undertaking, it is Bayard Taylor, who, no doubt, is better acquainted and vastly more familiar with German literature, than any other of our literary men. The language is simple, plain and terse. The illustrations are numerous, but not as finely executed as might be desired. The frontispiece is most original, and shows that Mr. Taylor has grasped the true development of the German Empire.

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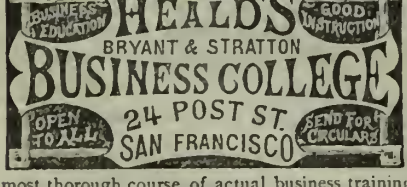

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THE

CALIFORNIA TEACHER.

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[*For the California Teacher.*]

BOTANY FOR SCHOOLS.

IV. THE ROSE FAMILY.

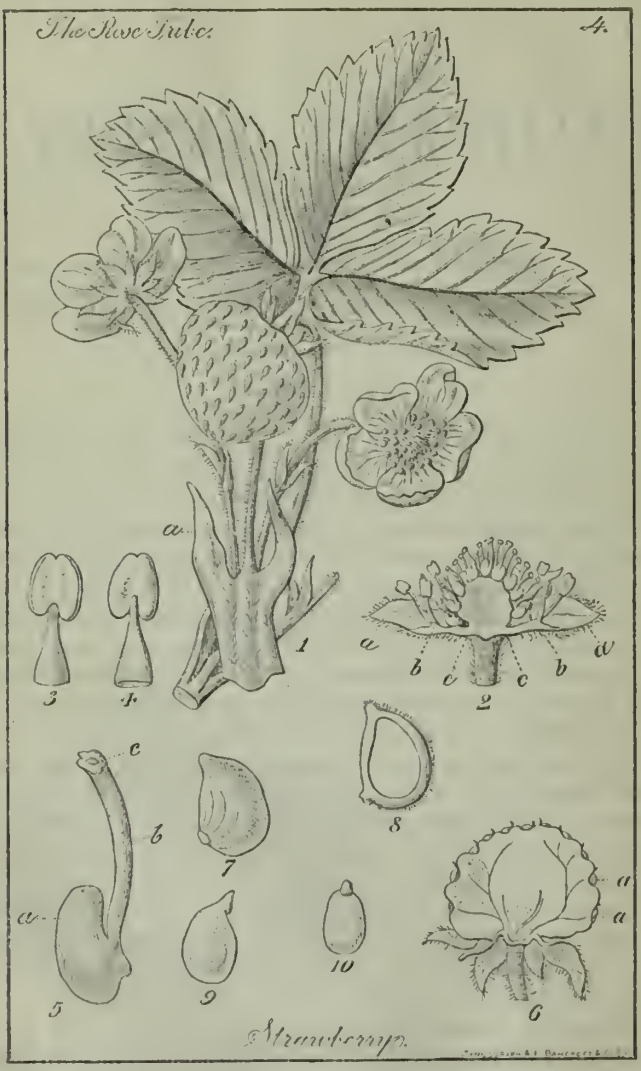
In this article we shall consider the structure of the Rose family, the most important of the whole vegetable kingdom, save that of the grapes.

The Strawberry (*Fragaria*) is an herb with three-parted leaves, and a pair of large membranous stipules at their base. (See plate 1, *a*.) The veins of the leaves are netted. When the Strawberry plant is about to multiply itself it puts forth naked shoots of two sorts. One kind is prostrate on the ground, and ends in a tuft of leaves, which roots in the soil, thus forming a new plant, or, as it is technically called, a runner; the other kind of shoot grows nearly erect, and bears, at its end, a tuft of flowers, which afterwards becomes fruit, or at least what is commonly called so.

The calyx of the Strawberry is a flat, green, hairy part, having ten divisions; it is, therefore, caused by the union of ten sepals, five of which are on the outside of, and smaller than the others.

The corolla consists of five petals.

The stamens are very numerous, and are placed in a crowded ring round the pistil, as in the Crowfoot, or Buttercup; but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Strawberry.

you will observe that they grow out of the side of the calyx, (fig. 2), and not from beneath the carpels.

The pistil of a Strawberry is very much like that of a Buttercup. It consists of a number of carpels, arranged in many rows, and with great order, upon a central receptacle. Each carpel has a style, which arises from below its point (fig. 5), and terminates in a slightly lobed stigma. In the inside of the ovary is one single ovule. With the flower the resemblance between the Buttercup and the Strawberry ceases.

You will almost wonder, now that you know how the young flower of a Strawberry is constructed, how so singular a fruit is to be formed out of such materials, especially if you should have chanced to meet with the ingenious explanation given of it by some botanist, whose name I forget, that it is a berry with its seed on its outside. Many and strange are often the changes that take place in the organization of a pistil in the course of its transformation into a fruit, and they are highly curious in this case. If you would really understand them, you should watch the Strawberry in the progress of its growth. You would then see that the first occurrence after the petals have fallen off, and the calyx closed on the tender fruit, consists in the receptacle of the carpels beginning to swell, and, shortly after, in the carpels themselves gaining a greater size and a more shining appearance, while, at the same time, their styles begin to shrivel up. At a more advanced stage the carpels are found but little augmented in size, while the receptacle has increased so very much in dimensions that the carpels are beginning to be separated by it, and the surface of the receptacles can be distinctly seen between them. A little older, and the carpels seem scattered in an irregular manner over the surface of the receptacle, which has become soft and juicy, while the carpels have remained almost stationary in size. All along, the swelling receptacle has been pushing the calyx aside, as being no longer of use to it; and at last you scarcely remark the calyx, in consequence of the much greater size of the receptacle. This part finally gains a crimson color, swells more and more rapidly, acquires sweetness and softness, and at last is the delicious fruit you are so well acquainted with. In that, its final state, the carpels are scattered over its surface in the form of minute grains, looking like seeds, for which they are usually

mistaken. You, however, know better than to fall into this common error, for you have seen that at first they had each a style and stigma, which seeds never have; and you can now, by cutting them open (fig. 8), detect the seed (fig. 9) lying in the inside of the shell of the carpel. The Strawberry is, therefore, not exactly a fruit, but is merely a fleshy receptacle bearing fruit, the true fruit being the ripe carpels.

The Raspberry, Blackberry and Thimbleberry, also claim kindred with the Strawberry, because of their likeness to it. They are shrubby plants. In this respect they differ from the Strawberry. Their calyx has only five divisions instead of ten, which is a difference; but their petals are five; the stamens numerous, and arising out of the side of the calyx, and their pistil composed of a number of carpels arising out of a central receptacle; these, again, are resemblances with the Strawberry in important points. Let us examine the fruit. The Raspberry has a dry core, off which you may pull the little thimble-like fruit, and you will not find any of the dry grains which stick upon the outside of the Strawberry. But look again. What are the little dry threads that you see rising from the center of a multitude of little projections, with which the whole surface of the Raspberry is covered? Surely they are styles; and, if so, the projections out of which they grow must be carpels in a ripe state. This is really the case. The carpels of the Raspberry, instead of remaining dry as they become ripe, swell and acquire a soft pulpy coat, which, in time, becomes red. They are crowded so closely, that by degrees they press upon each other, and at last all grow together into the thimble-shaped part which you eat. In order to gain this succulent state they are forced to rob the receptacle of all its juice, and, in the end, separate from it, so that when you gather the Raspberry you throw away the receptacle under the name of core, never suspecting that it is the very part you had just before been feasting upon in the Strawberry. In the one case the receptacle robs the carpels of all their juice in order to become gorged at their expense; in the other case the carpels act in the same selfish manner towards the receptacle.

It is now necessary that we should examine the Rose, this charming flower, in the construction of which you will find as much to admire as in its external attractions. In the flower

much seems to differ, although in reality but little essential difference exists between the Roses and other Rosaceous plants. It has a calyx of five divisions, some of which are very like small leaves. To these succeed five petals, and within the latter is a great number of stamens, which grow from the side of the calyx. You will not, at first sight, perceive any pistils. In the centre, indeed, is a tuft of stigmas, but no ovaries are visible; upon further search, however, you may discover, especially if you press the flower forcibly between the finger and thumb, that the styles project through the neck of an oblong green body, which being below and on the outside of the calyx, looks like an inferior ovary. If you split the flower perpendicularly you will then perceive that this body that looks like an inferior ovary is, in reality, the tube of the calyx, which is contracted at the place where the stamens originate, into a narrow orifice, through which the tops of the styles protrude, or forming as usual the bottom of the styles. The ripe fruit, or hep of the Rose, is nothing more than the same tube of the calyx turned red and fleshy, the sepals, and petals, and stamens having dropped off. In its inside will be found the carpels changed to bony grains, covered with coarse stiff hairs.

Thus far we have treated of plants belonging to the first tribe of the Rosaceous family; but in order to demonstrate the great importance of this family to mankind, we must consider also two other groups or tribes of plants, usually classed with the Rosaceous family, namely the Apple and the Almond tribe.

In the Apple tribe, to which belong all those plants which agree with the Rose tribe in everything but the carpels being distinct and superior—we find that the carpels are united and that they adhere to the tube of the calyx. Take an apple tree in flower as an example of this. The calyx has five divisions, the petals are five, and there are a great many stamens growing out of the sides of the calyx. In the centre you will find five styles, but their ovaries instead of being merely enclosed within the tube of the calyx, adhere and form one body with it. It is this circumstance that gives rise to all the difference that you find in the fruit itself. An apple is a large fleshy body, having at one end what is called an eye; which is in reality the remains of the calyx surrounding the withered stamens. The principal part of the flesh is the tube of the calyx, but the con-

tral part is the carpels, also grown fleshy, and at this period undistinguishable from the calyx itself; that their number was five is shown by the five cavities in the centre of the fruit, each of which contains one or two seeds. Now it is obvious, if this description be carefully considered, that the fruit is the only thing by which the Apple is known for a Rosaceous plant. The same kind of structure is found in the Pear, Quince, Mountain Ash, Medlar and Hawthorn.

The Almond group or tribe. This is less different in structure than the Apple tribe, but more dissimilar in sensible properties. It consists of species which have all the essential parts of structure of a common Rosaceous plant, but which bear fruit like that of a plum. The Plum tree flower has a calyx of five parts; five petals, and a great number of stamens arising out of the sides of the calyx. But in place of many carpels, there is only one; and that one changes to a fleshy body containing one single seed enclosed in a hard stone. The hard stone is the lining of the cell of the carpel, separated from the fleshy rind that is on the outside. This kind of fruit is called a Drupe. What is found in the Plum exists equally, and but little modified, in the Apricot, Peach, Nectarine, Almond, Sloe and Cherry, all which are species of the Almond tribe.

Instead of being perfectly wholesome, some members of this tribe are highly poisonous, as the common Laurel (*Prunus laurocerasus*), the leaves of which yield the dangerous infusion called laurel-water. This is owing to their yielding a volatile principle called Prussic acid, which in its concentrated state is one of the most dangerous of poisons. Plants of the Almond tribe have also this peculiarity in which they differ from Roses: their bark yields gum, as you may see by the cracked branches of diseased cherry and peach trees.

If you analyze the characters of these tribes, you will find that their differences arise mainly from the relative position of the ovary, whether it is superior or inferior—and their differences may be expressed thus:—

Rosaceous family. { Ovary superior, { many carpels—Rose tribe. / one carpel—Almond tribe. / Ovary inferior.....Apple tribe.

A family of such vast importance to us, both in an economic as well as an ornamental point of view, should be carefully studied and well mastered. This can be easily done, for there

is certainly no want of proper material for illustration. What place in California could be found not having some kinds of those plants, above mentioned, under cultivation?

But it is desirable to acquaint our children also with some indigenous plants belonging to this family. To the Almond tribe belong: *Cerasus ilicifolius*, an evergreen cherry, forming often a beautiful tree in favorable localities. *Prunus subcordata*, the beautiful wild plum of the higher Sierras—Downieville, Sierra Valley, Mount Shasta, etc.—so largely collected by our people inhabiting those sections of the State.

To the Rose tribe belong: *Nuttallia cerasiformis*, a beautiful deciduous shrub. *Spiræa opulifolia*, Nine-Bark, a large bush very common on all our streams. *Spiræa ariæfolia*, also a large bush and quite common on the banks of creeks. *Spiræa Douglasii*, a beautiful bush growing in the mountains, and also cultivated in our gardens. Spiræas are usually called Meadow Sweet. *Adenostoma fasciculata*, the well-known chemisal forming the dark-looking chaparral which covers so many of the hillsides in the interior of the State. *Fragaria Chilensis*, a wild strawberry, generally found on sandy soil near the coast line. *Rubus Nutkanus*, the Thimble-berry. *Rubus spectabilis*, the Salmon-berry, found growing along our northern coast.

To the Apple tribe belong: *Photinia arbutifolia*, the Tollon of the Mexicans, a tall shrub or small tree on hillsides and banks of creeks, quite ornamental in Fall on account of its scarlet-red berries, borne in large heavy bunches at the end of the upper branches. In Spring it is almost equally ornamental on account of its numerous bunches of small white flowers. It is an evergreen, and sparingly cultivated in gardens. If this beautiful plant had come to us from Japan or any other distant country, it would be found in every garden. *Amelanchier canadensis*, the Service-berry, or June-berry, a large white-flowering shrub found almost in all parts of the State, especially northward.

EXPLANATION OF THE PLATE. 1. A leaf, a few flowers and fruit of a strawberry plant; *a*, stipules. 2. The calyx and pistil cut through to show the origin of the stamens; *a*, sepals; *b–c*, tube of the calyx. 3. A stamen seen in front. 4. The same seen from the back. 5. A carpel; *a*, the ovary; *b*, the style; *c*, the stigma. 6. A fruit cut through perpendicularly to show the fleshy receptacle and the grains, *a*, sticking to it. Compare this with fig. 2. 7. A ripe grain. 8. The same, cut through to show the seed. 9. A seed extracted from the grain. 10. An embryo with the radicle at the upper end.

JOHNNY BEGINS TO STUDY BOTANY.

By ADAM STWIN.

Johnny is an imitative little fellow. Whenever he sees any one doing anything, he is very apt to want to do it, too. He came the other day to my summer study-room—in the hay barn on the hill, where the air is always fresh and cool—and found me busy with a lot of plants that I had gathered in the woods that morning. He looked on curiously for a little while, then asked what I was doing that for.

"Doing what?"

"Why, picking all those weeds to pieces and putting them away in those big books."

"I'm afraid you haven't been looking sharp," I replied. "I don't put away those I pick to pieces."

Johnny was still again for two or three minutes, then he broke out with, "What do you pick them to pieces for?"

I told him they were plants that were new to me, and I was studying them to learn what they were like and what their relations were.

"Relations! Do plants have relations?"

"Certainly," I replied.

"That's queer! And is that the way you learn so much about them?" Johnny asked.

"Chiefly."

"I wish I could do that," he said, after another period of silent watching.

"So you can."

"When?"

"Any time; now, if you want to."

"Will you show me how?"

"With pleasure."

"Right away?"

"Right away."

"Well," said Johnny, after waiting awhile, "I'm ready."

"So am I."

"But I don't know what to do," said Johnny.

"You must get your plants first," said I.

"Where?"

"Anywhere—out in the garden, if you like."

Johnny ran to the garden, and was soon back again with his hands full of leaves and stems.

"Will these do?" he asked.

"Suppose you wanted to study animals, and I should give you the ear of a dog, the tail of a cat, the foot of a hen, a cow's horn, and a piece of sheepskin to begin with; do you think they would help you much?"

Johnny laughed at the idea of such a mess, and said he thought a whole dog would be better.

"A good deal better," said I; "and a whole plant would be better than all these pieces."

"Can't you tell me what their names are from the pieces?"

"I could," I replied, "but names are not what you are to study. You are to study plants."

"Of course," said Johnny, not knowing what else to say.

"I will go with you," I said, "and show you how to get something to study."

When we reached the garden, I stooped to dig up a weed that few boys in the country do not know something about—purslain, or as it is commonly called, *pusley*.

"What is the use of taking that?" inquired Johnny. "Everybody knows what that is."

"We'll take it, for all that," I said; "perhaps we may learn something about it that you never noticed before."

"That's catnip," said Johnny, as I began to dig up another plant that stood near the first. "You aren't a-going to take that, are you?"

"Why not?"

"'Cause," said Johnny, "I've known catnip ever since I can remember."

"Shut your eyes," said I. "Now tell me what kind of a stalk catnip has."

"Why," said Johnny hesitating—"it's just like——any other stalk."

"Like pusley?"

"No; pusley hasn't any stalk; it just sprawls on the ground."

"Like mullein stalk?"

"No," said Johnny; "not like that."

"Like corn stalk or thistle?"

"Not like them either," said Johnny. "It's like——I guess I don't remember exactly what it is like."

"So you don't know catnip so well as you thought," said I.

"These two will be enough to begin with," I continued. "Study them carefully, and when I have finished with my plants I will come to see how you get on."

Johnny soon tired of studying by himself, or maybe he did not find much to learn; at any rate it was but a little while before he stood at my table, plants in hand.

"Well," I said, as I put away my work," what have you discovered?"

"Catnip stalk is square," said the young botanist.

"Good," said I; "anything more?"

"It smells," said Johnny.

"What like?"

"Like—like catnip-tea," said Johnny.

"Very like, indeed," said I. "What else have you learned?" Johnny hesitated.

"Is the pusley stem anything like catnip?" I asked.

"Do you call those stems, when they don't stand up?" was Johnny's reply,

"Yes, those are stems."

"They're round," said Johnny, "and smooth. Catnip is fuzzy a little, and the stems are straight."

"Anything more?"

"The leaves are bigger than pusley leaves, and thinner and softer," said Johnny, comparing them.

"We have'nt finished with the stalk yet," I said. "Can you tell me anything more about it?"

"That's all I know," said Johnny.

"How about the color?"

"It's green."

"Is the pusley stem green?"

"Some of it, and some of it's almost white, and some is almost red; queer, isn't it?" he went on spreading the plant out as it grew in the garden. "The under side of the stems is pale, and the upper side is red—tanned, I guess, in the sun."

"It looks like it," I said; "What is the color inside?"

"Shall I break it?"

"Certainly."

Johnny bent the pusley-stem with both his hands, and to his great surprise it snapped short off.

"Oh!" he cried, "how brittle it is; I didn't think it would break so sudden."

"Try the catnip-stem."

"It wont break," said Johnny.

"Cut it with my knife."

"It's tough," said Johnny, "and woody and hollow. The stalk is square but the hole is round."

I took the knife, cut the stem across at a joint, and said: "I don't see any hole here."

Johnny was puzzled. "See," I said, splitting the stalk lengthwise, "the hollow is closed up at the joints where the branches begin."

"I shouldn't have thought of that," said Johnny.

"What a lot of things there is to learn about one stem."

"We've scarcely made a beginning yet," I said. "But before we go further let us recall what we have already found out:

"The catnip stalk is square; stands up straight; has a strong odor; is slightly fuzzy; is green; is tough and woody; will not break easily; is hollow, except at the joints; and——"

"That's all I can think of," said Johnny.

"And the pusley stem is round; lies flat on the ground; is smooth; brittle; pale green below, and red on top; solid—— Are you sure of that?"

Johnny split a pusley stem its whole length, and said there was no sign of a hole in it, adding meditatively, a moment after: "It takes a great deal of study to find out all about a plant, don't it? if it *is* a weed."

"A very great deal," I said.

"I think I know all about these, now," said he.

"Oh no!" said I, "not nearly. You have'nt learned anything about the roots yet, nor the branches, nor how they grow, nor about the flowers, nor the seeds, nor when they come up in the Spring, nor when they die in the Fall, nor what things eat them, nor what they are good for, nor what their relations are, nor—" "I'll never be able to learn all that!" cried Johnny, fairly frightened by the magnitude of the task he had undertaken. "And there are such a lot of plants!"

"It would be a terrible task, indeed," I replied, "if you had to learn it all at once. But you have'nt. Just keep your eyes open, and take notice of the different plants you see, and you will get better and better acquainted with them every year. The older you grow, the faster you will learn, and the more you will enjoy it. In a few years it will be pleasanter than play to you."

"I hope so," said Johnny, resolutely; for I've got to learn them all. I'll try, anyhow."—*Christian Union.*

FIRE SCREENS.

By Lucy J. Rider.

"Nonsense! That's too thin," exclaimed Lewis, throwing down his book in some excitement.

Lewis' mother looked around from her sewing. "What is it?" said she.

"Why, mother, just listen," and picking up his book again, Lewis read:

"'It was at least ten miles to the nearest shore, and late at night, so we built a roaring fire on the ice out of the broken sled, and wrapping our buffalo skins around us, lay down to sleep;' and, mother, he goes right on to tell of cutting through the ice, and finding it only a foot thick, and then he finishes off by declaring that his whole story is a true one!" and again the book went down.

"Oh!" said Mrs. Morrell quietly; "I understand now. You mean that the ice of your story is too 'thin.' I thought at first it sounded like slang."

Lewis colored and laughed a little.

"I'm sorry, mother, but the fact is, such a yarn as that would make a minister forget. I like a made-up story well enough, when a feller knows what it is, but when a man *says* he tells the truth, I like to have him tell it."

"Well, what is the trouble with this man's story?"

"Why, Mother Morrell! a roaring fire on ice a foot thick! In the first place, I don't believe they could build a fire at all

on ice; the ice would melt and the water would put it out. But s'posing they could, how long would it take a big fire to melt through a foot of ice?"

Mrs. Morrell did not answer, but there was something in her quiet smile that made Lewis feel a little uncertain.

"Say, mother, wouldn't it melt right through?"

Just then a new idea popped into his head, and he jumped up, knocking over the fire-screen in his hurry, and scaring Johnny's kitten almost out of her senses. "I'll find out," he exclaimed, "this very night. There's a tub of water frozen over in the yard, and it isn't eight o'clock yet."

"Le' me go too—mayn't I ma?" asked Johnny, getting interested now his kitten had run off under the sofa; and permission being given, off they went.

In a little while they came back with rosy faces and numb fingers.

"We built a fire right in a tub!" shouted Johnny.

"It *did* burn," cried Lewis. "The ice was so thin it wouldn't hardly bear the wood, but we made a little pile right in the middle, and it all burned out and didn't melt through at all!" and Lewis sat down on a stool, put his feet to the fire, and shielded his face from the heat with a paper.

"Yes," put in Johnny, "it shined like the Fourth of July, and we warmed our fingers; didn't we Lewie?" and he spread his little red hands toward the fire to warm them again.

"Fourth o' July! you don't very often get such cold weather as this, Fourth o' July."

"Johnny means it was a nice bon-fire," explained the mother.

"I peeped under the sticks to see why it didn't melt," said Lewis, but I couldn't find out. It looked wet at first, and I thought 'twas going, but it didn't even wet the ashes through. It was very strange."

"Very strange," echoed little John, looking thoughtful.

"Why do you hold that paper before your face, Lewie?" asked Mrs. Morrell.

"So I can get my feet warm without burning my face all up."

"Oh! then the heat don't go through the paper?"

"No, ma'am, not much."

"Well, the reason why the ice didn't melt was that there was a fire-screen like your paper between it and the fire."

Lewis came round on his stool very suddenly, and Johnny was so surprised that he forgot to warm his hands.

"Why, mother, there wasn't anything at all between 'em. The fire was right on the ice," cried Lewis.

"I thought you said the ice melted a little."

"So it did, at first."

"Then wasn't there a layer of water over the ice?"

"So there was," nodded Lewis.

"Well, that was the fire-screen that kept the heat from the ice, and it was a much better one than your paper is."

"Why-ee!" exclaimed Johnny.

"Now," continued Mrs. Morrell, "if I only had a deep dish of thin glass I could show you with the thermometer how perfectly a little water will protect anything from heat. I would fill the dish with water, and——"

"Look-a-here, mother, why can't we use this case?" cried Lewis, carefully lifting the glass cover from a beautiful wax cross that stood on the table. "Turn this over and it makes a nice dish, and we won't break it."

"If I was sure we wouldn't break it," said Mrs. Morrell, "it would be just the thing, and I guess we'll run the risk. Lewis, bring in a pitcher of water and a match; and, Johnny, run to papa's office and ask him to send me a bottle of ether."

When they came back Mrs. Morrell took the thermometer from the mantel and put it, wrong end up, into the glass case, which was turned over, making a deep round-bottomed dish. This she held steady on the table, and desired Lewis to pour water into it, till the thermometer was covered.

"Now, Lewis," said she, "I will keep the dish steady, and you may pour a little of this ether on the water. You know ether don't mix with water, and, as it's lighter, will stay on top. Then light the match and hold to it, and it will take fire and burn like coal-oil on the water; and if any heat passes down to the bulb of mercury the thermometer will show it. How far is the bulb below the water, Lewis?"

"It's only just covered. Hadn't I better put on a little more water?"

"No, if it's fairly covered that's all that is necessary. Now, Johnny, it shall be your work to look through the side of the case, and tell us if the mercury in the tube moves. How does it stand now?"

"Seventy-one," said Johnny, twisting his head round to read the inverted figures.

"All right. Now, Lewis, turn slowly, and be careful not to smell it."

Lewis trembling with anxiety, turned a little from the ether bottle on the water.

"That'll do," said his mother; "now light it."

Scratch! crackle! went the match in Lewis' eager fingers, and, with a little puff, the ether burst into a light wavy flame.

"Oh! oh!" exclaimed Johnny.

"Look! look!" cried Lewis in great excitement. "Does it stir?"

"You can look, too, while it's burning," said Mrs. Morrell.

Down went the boy on his knees by his brother.

"Does it stir?"

"No, no! not a bit," cried the boys—nor did it stir at all, though the ether burned some time.

"My gracious!" said Johnny, when the flame finally died away. "It looked just as if the water was burning. "But wasn't it pretty?"

Mrs. Morrell lifted the thermometer and put her finger on the bulb. The mercury rose to ninety degrees.

"See," said she, "even the warmth of my finger raises it twenty degrees, and the intense heat of that burning ether would have sent it up a great ways if it had reached it; but that little layer of water kept it all away."

"I wouldn't have believed it," said Lewis. "But see here, mother, will a layer of water protect wood or anything else from the heat just the same as ice?"

"Yes, of course."

"Then it will keep heat from passing through to other water, won't it?"

"Yes, if you can keep your different layers of water perfectly still."

"Well, then, I don't see how in the world you can ever heat any water. I should think the layer of water next to the bottom of the kettle would prevent all the rest from getting any of the fire."

"Yes; but the idea is, you can't keep your different layers of water separate and quiet when you apply the heat *from below*, because warm water is lighter than cold, and the layer on the

bottom, instead of lying still and protecting the rest, rises to the top as soon as it gets heated a little, giving place to another layer of cold, which gets warm and rises in the same way; and so the story goes on till all is warm."

"Sure enough," said Lewis, "that's as plain as it can be."

"Let's see if we can't make it a little plainer," said Mrs. Morrell. "While we have this bell-glass we may as well use it."

So saying, she filled it again about half full of water, and, producing from her work-basket a paper of coarse gray powder, she sprinkled a little into the water. It floated slowly down, and finally settled in a little heap at the bottom.

"What's that?" asked Johnny, who was a good deal more interested in the experiments than in the explanations.

"It don't make any difference what it is," replied his mother. "Any coarse powder that don't dissolve in water and isn't too heavy would do just as well."

Mrs. Morrell then held the cover directly over the gas-jet. As the water over the flame became heated it rose nearly to the surface, carrying the bits of powder with it. Then it fell gracefully over like a fountain, and sank slowly down by the sides of the dish to the bottom again.

"Oh, how pretty! It's as nice as a fountain!" cried the boys.

"It *is* a fountain," said their mother, "only it's in water, instead of in air."

"And there's one of these fountains every time any one heats water," said Lewis admiringly.

"Does it, mamma? Does the water go just so in all the big black kettles?" queried little John.

"Yes, dear," said mamma. "But, Lewis, don't you think you owe the magazine-man an apology for calling his story 'thin'?"

Lewis turned round to the magazine, still on the floor in the corner, and, making a low bow, "I'm very sorry that I called you thin, old fellow," said he; "you're all right, it seems, and it's somebody else that's thin after all. So now, if you'll excuse me, we'll shake hands and call it even."

So saying, he picked up the book, shook it vigorously and laid it on the table.

Johnny laughed. Then he gave a great yawn.

"Come, Lew, let's go to bed," said he.—*Christian Union.*

JOHN AMOS COMENIUS.

[We copy the following brief sketch of the life of John Amos Comenius, with a general statement of his principles as an educator, from Hailman's History of Pedagogy, published by Wilson, Hinkle & Co., Cincinnati. It would be difficult to point to a single principle held by the most advanced educators of our day, which does not seem to have suggested itself to his mind.]

JOHN AMOS COMENIUS was born in the year 1592, at Comnia, in Moravia. His early history is obscure; it is known, however, that he attended the University of Herborn, at Nassau, where he studied theology. In 1614 he returned to his native land and became rector of a school, and, in 1618, pastor of a parish of Bohemian Brothers. In 1624, Ferdinand II banished all evangelical preachers from his realms, and Comenius took refuge at Lissa, in Poland, where he became, in 1628, member of the faculty of the academy. Here he completed his first didactic works of importance, among which the "Key to the Study of Languages" founded his reputation. It appeared in 1631, and was received with such immense applause that in a short time it was translated into twelve European and several Asiatic languages. In 1641, he accepted a call of the English Parliament to visit England, and to reform the English schools according to his principles; but civil war neutralized his efforts, and he yielded to a similar call from Sweden, in 1642, where he was more successful. Soon afterward he returned to Lissa, where he was made a bishop of his church in 1648. In 1650, he accepted the call of a Hungarian prince, to assist in the reorganization of schools, but returned to Lissa four years later. In 1652, the Poles burned Lissa and scattered the Bohemian Brothers forever. His subsequent wanderings brought him to Amsterdam, where he was cordially received. He died at Naarden, a neighboring town, in 1671. During his stay in Hungary he had composed a remarkable school-book, entitled the "*Orbis Pictus*," which I shall have occasion to mention again hereafter.

Comenius was by no means one of those pedagogues who take up one or another single subject of instruction, or who place all good in a certain method of teaching. He was, in the very best sense of the word, universal; and notwithstanding this universality, he always strove after the most thorough foundation. The aim of education he finds in wisdom, in

kuowledge, virtue and piety. He contended that all men need instructiou; that all children, rich and poor, high and low, boys and girls, should be tanght in school. "Not," he adds, "that each should learn every science; but all should be so iustructed that they may understand the basis, relation, and purpose of all the most important things, having reference to what they are and are to become." He complained that the educational systems of his time did not accomplish this. In many places there were no schools at all, and in others only the children of the wealthy were cared for. At the same time, he condemns the methods of instruction as repulsive, tedious and misty; and deplores the neglect of moral training, the absence of science in the curriculum, and the undue preponderance of Latin.

He proposed a system of educational institutions, consisting of four divisions: the maternal school, the vernacular school, the Latin school, and the academy.

The maternal school comprises domestic education under the mother's direction, and lasts during the first six years of the child's life. Its main care is the sound mind in the sound body. The mother must attend with intelligent solicitude to the physical welfare of her child; she must nurse it herself; guard it from all stimulants and quackery; offer it opportunities for cheerful play, for manifold observations, accompanied with simple instructions; and implaut the seeds of virtue and piety.

He shows ingeuiously how, already during the first six years of life, the child can and should obtain in the parental home the elements of all later knowledge. He shows how from the cradle it gradually extends the scope of its perceptious to the sitting-room, the other rooms of the house, the yard, the streets, the gardens aud fields, to suu, moon aud stars; how it becomes familiar with its limbs and their uses, with animals, plauts, stones, and their names; how it learns to distinguish light from darkness, day from night, colors, shapes, numbers, aud souuds; how it gains ideas of longer and shorter periods of time, of the development of organic life, of human institutions; how it becomes skilled in song, language, and gestures. In short, Comenius sketches an elementary course of object lessons, of exercises iu intuition, in thinking and speakiug, and shows that it contains the priuciples of all subsequent instruction in geography, natural science, geometry, arithmetic, music, language, etc. At the same time, parents should, particularly

by example, develop correct moral feelings, and lead their children to moderation, cleanliness, obedience and modesty.

When the child is ready for the vernacular school, the latter should present itself in a friendly, not in a repulsive light. The vernacular school, similar to our district school, furnishes instruction to the child from the sixth to the twelfth year. Comenius asks that it should teach only the vernacular language (hence its name), and that it should lay great stress upon practical education. Reading, writing, orthography, arithmetic, measuring, song, religion, the elements of history, natural science, geography and astronomy, popular instruction about trades and arts, should constitute the curriculum of exercise and study. Thus, he would make the vernacular school an institution that prepares for life as well as for the higher institutions of learning.

With reference to the latter, I would merely state that Comenius lays down for them, among others, these principles: without knowledge, rational thought, speech and action are impossible, hence the sciences must be nurtured; avoid words without ideas; let the concrete always precede the abstract. To deal more largely with these higher institutions does not lie within our limits, and I return to his views on elementary instruction.

School, he says, is a workshop of humanity; it is to bring man to the ready and proper use of his reason, his language, and his artistic skill—to wisdom, eloquence, and prudence. Hence, its material of instruction must be valuable and comprehensible for all the children of the people, and must tend to their universal cultivation. Whatever bears no fruit in life nor enhances humanity, whatever tends to empty words and shallow mechanical drilling, is not for the school. The material of instruction must be selected with care, and treated in accordance with natural methods that agree with the normal development of children and take into consideration their manifold individual peculiarities. First, the senses are to be set to work; then, memory; and, at last, understanding and judgment. The pupil must not learn by heart what has not become his from perception or reflection; he must not speak about what he does not understand. The thing must precede the word; the example must come before the rule. In all branches, the easy and the simple thing must come before the difficult and the

complex. Nor should the child receive much or many things at once, but progress gradually and continuously.

Thus, the clear mind of Comenius was already fully aware of the methodical laws which require that all instruction should be based on intuition, should be gradual, thorough, and continuous; but it was no less evident to him that all instruction must arouse and enhance the self-activity of the learner. The child, he claims, must use his senses as perceptive powers; must observe surrounding objects; compare its perceptions; form concepts, judgments, conclusions from its ideas; learn to express its thoughts clearly and fluently; and fix its knowledge, as well as improve its skill, by varied practice. In short, all the powers of the pupil must be kept in activity. Knowledge must not be given to the pupil as something finished, as something ready-made or cut-and-dried, but it must be found from its elements; or, as Comenius expresses himself, "the teacher must not sow plants instead of seeds."

Wheresoever circumstances permit it, Comenius would lead the pupils to obtain their fundamental ideas, at least, from the direct observation of objects, or, in the absence of these, from the pictures of objects. In order to supply such pictures, and in order to fix and arrange the ideas gained by the child, he composed a book, "The *Orbis Pictus*, the Visible World; that is, the Pictures and Names of all the Principal Things in the World, and of all the Principal Occupations of Man." In spite of its many faults in technical execution and arrangement, this remarkable book exerted a wonderful influence upon the schools, and did much to diffuse more rational views upon education.

While Comenius thus gave clear directions concerning methods of instruction, he never lost sight of the disciplinary and pedagogic side of the school. He insists repeatedly that the school is not only to impart knowledge and skill, but that it must, at the same time diffuse virtue and piety, and develop as well as strengthen perseverance, punctuality, orderliness, justice, etc. He asks for airy and light school-rooms, and considers play-grounds essential to a well-regulated school. At the same time, he deems frequent walks with the classes absolutely necessary, to render the children familiar with nature and human occupations. In short, Comenius aims not at intellectual culture alone, but at a harmonious development of the entire human being. He is a pedagogue in the fullest sense of the word.

DEPARTMENT OF PUBLIC INSTRUCTION.

IN order to answer fully sundry queries regarding the apportionment of school moneys, addressed to this department by several County Superintendents, we shall once more briefly review the new method of apportioning school moneys.

The revised School Law was approved by the Governor on the 28th of March, 1874, and was in full force and effect from and after that date. All school moneys, county or State, apportioned after March 28th, 1874, must, therefore, be apportioned according to the new method. Let us confine ourselves, however, to the moneys which are apportioned on and after the 1st of July, 1874. We must premise that neither the State Superintendent nor a County Superintendent can take into consideration the sources from which the moneys to be apportioned are received. By either only the fact must be considered that a certain amount of money, as reported to him by the proper officer, is in the Treasury, subject to apportionment, and the Superintendent must then proceed to apportion this amount of money according to the provisions of the School Law. Thus, on the 1st of August, 1874, the Controller reported to the State Superintendent that $104,906.62 were on hand in the State Treasury, subject to apportionment. A portion of this amount was derived from delinquent taxes; another portion accrued to the School Fund before the close of the school year, June 30th, 1874. It may seem, therefore, that these portions of the amount of School Fund reported by the Controller August 1st, 1874, belonged to the previous school year, and should have been apportioned for that school year. They would have been so apportioned if an apportionment had been made before the close of the school year. As the law did not allow this, however, all school moneys on hand in the State Treasury at the close of the school year, had to be apportioned in and accredited to the new school year. The same holds good of the county school funds. Any county school funds accruing between two successive apportionments, must be credited to the school year in which the apportionment is made, and must not in part or whole be credited to the year or years whose delinquent taxes contributed to the amount apportioned. If County Superintendents desire to apportion to each school year as much as possible the proceeds of the taxes for that year, they should make their last apportionment for each year, on the 30th of June at the latest. An apportionment made on and after the 1st of July must be credited to the school year beginning on that date, and not to the school year just closed.

To return from our digression. All apportionments, whether of State or of county funds, made on and after July 1st, 1874, must be made according to the new method. All apportionments, whether of State or county funds, made between July 1st, 1874, and June 30th, 1875, both dates inclusive, must be credited to the present school year. To show the method of apportioning school moneys we give an illustration, taking for this purpose Alameda County. To apportion $500 to each district for every teacher assigned, Alameda County must apportion $49,160. Until $49,160 have been apportioned, no pro rata apportionment can be made. Each successive apportionment, whether of State or county school funds, made on and after July 1st, 1874, must be divided into the number of teachers for the county (ascertained according to the provisions of Subdivision 1, of Section 1858), and the quotient will give the amount to be credited to each district for every teacher assigned it. But as soon as the sum of the different ap-

portionments already made amounts to $49,160, the districts having less than fifty census children will have received the $500 to which they are entitled by law. The excess over $49,160 must be apportioned pro rata among the districts having not less than fifty census children.

Assuming that since July 1st, 1874, and up to date, Alameda County has apportioned $10,000 County School Fund, and knowing that it has apportioned already $5,343 State School Fund, each district will have received $101.69 county school money, and $54.33 State school money, for every teacher assigned. Alameda County will have to apportion $33,817 more before each district will have received $500 for every teacher assigned. This amount will undoubtedly be obtained from the County School Fund to be apportioned in January, 1875, so that the State School Fund to be apportioned next March will go entirely to the districts having not less than fifty census children. By this means districts having less than fifty census children will receive only $54.33 (apportioned in August, 1874) State School Fund, from which ten per cent. are deducted for Library Fund. In order to give each district an equal proportion of County and State School Funds, we proposed in the September number of the TEACHER a mode of apportioning the two school funds, which we shall repeat here. Each County Superintendent can determine, approximately, the probable amount of County School Fund to be apportioned for the school year. To this add the probable amount of State School Fund for the year ($7.50 per census child, plus the amount already apportioned in August). The sum will give the probable amount of school funds for the school year. Determine in what proportion this sum is made up of county and State funds, and consider each district as receiving a like proportion of State and county funds. Ten per cent. of the State School Fund will be the amount of Library Fund. If, for instance, in Alameda County the probable amount of County School Fund for the year amounts to $31,000, and the State School Fund to $66,993 (which includes the $5,343 apportioned to Alameda County last August), $94,993 will be the sum of school funds to be apportioned this year, of which, in round numbers, one third are county funds and two thirds State funds, so that the money apportioned to a district may be considered as consisting of one third county school money and two thirds State school money. Ten per cent. of the latter will give us the amount of Library Fund to be credited to the district.

THE Library Fund is to be deducted from the moneys credited to the district. For districts having less than fifty census children the Library Fund must be deducted from the $500 apportioned to the district. Some trustees seem to think that a district will receive $500 and a certain amount of Library Funds. This is not so. The Library Fund is included in the $500 apportioned to the district.

LIST OF DIPLOMAS AND CERTIFICATES granted from July 18th to November 7th, 1874. The date immediately following the name gives the time of the expiration of the diploma or certificate.

Educational Diplomas.

Alexander, Mary J., Aug. 29, 1880.
Bloomer, A. C., Nov. 7, 1880.
Crane, Geo., Nov. 7, 1880.
Flint, Almira T., Oct. 3, 1880.
Minta, Wesley, Nov. 7, 1880.
O'Laughlen, Mrs. Nellie, Nov. 7, 1880.
Peadry, Frank A., Oct. 3, 1880.
Pratt, Miss Mary E., Oct. 17, 1880.

Educational Diplomas—Continued.

Freman, G. N., Aug. 29, 1880.
Hamilton, Hiram M., Nov. 7, 1880.
Hazen, P. J., Nov. 7, 1880.
Johnson, Jos. W., Aug. 29, 1880.
Kendall, Sylvia A., Oct. 3, 1880.
Kennedy, J. F., Oct. 17, 1880.
Lippowitz, Max, Aug. 29, 1880.
Mathews, Mrs. M. E., Aug. 29, 1880.
McKean, Lottie, Aug. 29, 1880.
Miller, Jno. H. Oct. 3, 1880.
Reavis, Walter Scott, Oct. 3, 1880.
Renfro, Lewis C., Aug. 29, 1880.
Ryder, Miss L. E., Aug. 29, 1880.
Salisbury, Mary A., Nov. 7, 1880.
Smith, Ansel, Aug. 29, 1880.
Smith, Miss Grace, Oct. 17, 1880.
Smith, Jas. D., Nov. 7, 1880.
Sollinger, J. A., Nov. 7, 1880.
Van Dorn, V. J., Aug. 29, 1880.

First Grade Certificates.

Avery, Sophie L., Aug. 29, 1878.
Batten, Mary, Oct. 31, 1878.
Bradner, W. F., Aug. 29, 1878.
Bradshaw, Wm. R., Aug. 29, 1878.
Bragg, Miss R. H., Oct. 31, 1878.
Bragg, Miss Lizzie, Oct. 31, 1878.
Butterfield, S. H., Oct. 31, 1878.
Call, Mattie C., Oct. 31, 1878.
Carithers, Eli, Oct. 31, 1878.
Carr, Francis, Oct. 3, 1878.
Casterlin, J. Bartine, Nov. 7, 1878.
Coleman, Jr. Charles, Aug. 29, 1878.
Convis, Mrs. M. E., Oct. 17, 1878.
Coolidge, Abbie, Oct. 31, 1878.
Cosgriff, Mrs. Amelia, Oct. 17, 1878.
Davis, Levi, Aug. 29, 1878.
Deacon, S. Anna, Oct. 3, 1878.
Dippel, Frances H., Oct. 31, 1878.
Drake, Milton, Oct. 31, 1878.
Dunphy, Jennie Collins, Oct. 31, 1878.
Dunphy, May R., Oct. 31, 1878.
Elder, J. C., Oct. 3, 1878.
Fowler, Foland Payson, Oct. 17, 1878.
Gilman, Martha A., Oct. 31, 1878.
Gilson, J. C., Oct. 31, 1878.
Glidden, R. Y., Oct. 31, 1878.
Gordon, Miss Mary A., Nov. 7, 1878.
Grigsby, Phebe P., Nov. 7, 1878.
Hayden, Mrs. Mary E., Nov. 7, 1878.
Heard, Miss Jennie, Oct. 31, 1878.
Henderson, Miss M. J., Aug. 29, 1878.
Hess, Tillie F., Oct. 31, 1878.
Hill, Miss Nettie F. Garton, Nov. 7, 1878
Horton, Geo. Wallace, Oct. 3, 1878.
Hunter, Jno., Oct. 31, 1878.
Kenniston, Chas. M., Aug. 29, 1878.
Kenniston, Mrs. C. M., Nov. 7, 1878.
King, Miss Florella, Oct. 17, 1878.
Kingman, Mrs. M. V., Aug. 29, 1878.
Klenck, J. F., Oct. 31, 1878.
Lillie, Jno. B., Aug. 29, 1878.
Lowell, Emma, Oct. 31, 1878.
Mann, S. J., Oct. 3, 1878.
Markham, Chas. E., Oct. 3, 1878.
McCarthy, Mrs S. L., Oct. 3, 1878.
McCleery, Lizzie, Oct. 31, 1878.
McDivitt, S. P., Oct. 3, 1878.
McFadden, Agnes, Nov. 7, 1878.
McKean, Wm. G., Oct. 3, 1878.
Michener, Mrs. Mary E., Oct. 31, 1878.
Miller, Sarah E., Aug. 29, 1878.
Mulgrew, Miss Mary J., Oct. 31, 1878.
Pitcher, Charlotte M., Oct. 31, 1878.
Powers, Talbot P., Oct. 31, 1878.
Rhodes, E. J., Aug. 29, 1878.
Rousseau, Mrs. Lida, Oct. 31, 1878.
Royce, Miss Ruth, Nov. 7, 1878.
Sarvis, G. C., Oct. 3, 1878.
Saxe, Heman A., Oct. 31, 1878.
Slack, Clay H., Oct. 31, 1878.
Smith, Lyman D., Oct. 31, 1878.
Smith, Eleanor M., Oct. 31, 1878.
Southeimer, J. J., Oct. 31, 1878.
Spring, Mrs. Fannie, Oct. 31, 1878.
Taylor, Catharine, Nov. 7, 1878.
Thomas, M. Agnes, Oct. 3, 1878.
Tucker, Ida A., Oct. 3, 1878.
Wall, Miss Clara, Aug. 29, 1878.
Weeks, M. L., Oct. 31, 1878.
Winchester, Mrs. W. H., Aug. 29, 1878.
Wooll, H. L., Oct. 3, 1878.
Workman, O. P., Oct. 3, 1878.

Second Grade Certificates.

Carithers, Louise J, Oct. 31, 1877.
Carpenter, Mattie E., Oct. 3, 1877.
Clason, C. S., Oct. 31, 1877.
Clement, Chas. H., Oct. 31, 1877.
Cline, Thos. W., Oct. 31, 1877.
Crittenden, J. L., Oct. 31, 1877.
Day, Annie, Oct. 31, 1877.
Jory, Miss Emma L., Oct. 31, 1877.
Killpatrick, E. C., Oct. 31, 1877.
Leary, Belle S., Oct. 31, 1877.
Lowery, Miss Kate M., Oct. 31, 1877.
Marshall, Geo. E., Oct. 31, 1877.
McCleery, Annie E., Oct. 31, 1877.
McFarland, Wm., Oct. 31, 1877.

Second Grade Certificates—Continued.

Graffelman, Lucinda, Oct. 31, 1877.
Hamilton, Maggie, Oct. 31, 1877.
Hamilton, Geo., Nov. 7, 1877.
Harwood, Miss Clara J., Oct. 31, 1877.
Hickey, Kate M., Oct. 31, 1877.
Jackman, Florence, Oct. 31, 1877.
Jorey, Bessie, Oct. 31, 1877.
Morton, Ella Jane, Oct. 31, 1877.
Nesbitt, Miss J. W., Oct. 31, 1877.
Peck, Mrs. Annie Earle, Oct. 31, 1877.
Peiser, Flora, Oct. 31, 1877.
Reese, Thos. B., Oct. 31, 1877.
Shepherd, Nellie E., Nov. 7, 1877.
Whelan, Elia E., Nov. 7, 1877.

Third Grade Certificates.

Alrutz, Miss Mary D., Oct. 31, 1876.
Banks, Lillie, Oct. 31, 1876.
Bills, R. Allie, Oct. 31, 1876.
Blakeslee, Helen S., Oct. 31, 1876.
Brooks, Lizzie M., Oct. 31, 1876.
Brooks, Margaret E., Oct. 31, 1876.
Bryant, Mrs. Martha L., Oct. 31, 1876.
Burscough, Lizzie, Oct. 31, 1876.
Clark, Mrs. Hattie, Oct. 31, 1876.
Classen, Louise M., Oct. 31, 1876.
Donnelly, Louisa, Oct. 31, 1876.
Fagan, Mary, Oct. 31, 1876.
Fleming, Mary A., Oct. 31, 1876.
Gilbert, Mrs. Henry D., Oct. 31, 1876.
Hawley, Clara M., Oct. 31, 1876.
Heney, Libbie S., Oct. 31, 1876.
Madden, Jennie L., Oct. 31, 1876.
Moore, Sallie V., Oct. 31, 1876.
Morse, Winora E., Oct. 31, 1876.
Saxton, Mary L., Oct. 31, 1876.
Strauss, Ida, Oct. 31, 1876.
Swain, Emily F., Oct. 31, 1876.
Walton, Miss Addie E., Oct. 31, 1876.
Wood, Miss Susie M., Oct. 31, 1876.

EDUCATIONAL ITEMS.

CALIFORNIA.

NEW SCHOOL HOUSE—The citizens of Grangeville and vicinity have had the enterprise to contribute the funds for a school-house 24x32 feet. It was done in the Grange, who reserve the right to its use. It will be on the land of Mr. Knawyer, who donated one acre and sold another for $20.

SOME important improvements have been made in the State Institute for the Deaf, Dumb and Blind, during the recent vacation. It commenced the Fall term with nearly a hundred pupils.

ON THE 13th of November the following resolutions were unanimously adopted by the Cloverdale Grange: *Resolved*, that this Grange earnestly hopes no change will at present be made in our school books; *Resolved*, that should the State Board of Education, in their wisdom, see fit to make a change, we deem it their duty to give the preference to California publishers if practicable.

THE training ship for boys, which the San Francisco mechanics prevailed on the Government to station there, will be ready for occupation in January next.

THERE are eighty names enrolled in the Normal Training School at San Jose.

ST. HELENA is excited over a proposition to use its public school building evenings for the purpose of teaching the Chinese.

SCHOOLS IN CALIFORNIA—We have one standing army in this State composed of 107,303 children enrolled in the public schools. There are, in addition, probably not less than 10,000 children attending private chools. According to the latest authority, more than 15,000 children have, during the past eight years, been transferred from private to public schools. It is certain that the public school system was never more strongly entrenched in the affections of the people of California than now. There is no tax more cheerfully paid by the mass of the people than the school tax. We have a compulsory education law in this State, but it is dormant. The fact is, there is such a general concurrence of opinion on the part of parents and guardians that all the children ought to be educated in some way, that there is little occasion for the law.

There never were a brighter hundred thousand children than this army now attending the public schools of this State. Most of these children will receive a good practical education—good enough for all ordinary business pursuits. They are nearly all California-born, and they will hereafter find homes in this State. We point with some degree of pride to the fifty millions of capital on deposit in the banks of the State—a capital which has been created by an industry largely inspired and stimulated by this army of children. Parents have been working not alone for bread, but to give their children better advantages than the former ever enjoyed. This "grand army" of California is something better than accumulated capital, and better these than all the wheat-laden ships which sail full freighted out of the Golden Gate. And then, it is a rapidly increasing army. Twenty years ago it was said that California was no place for homes. The men who came here had better leave their families at home. Their business was to make a little money and get out of the country as soon as possible. The extent to which this opinion has been reversed is pretty well illustrated by the fact that there are now 141,610 children in this State entitled to share in the benefits of the public school system which now affords an annual revenue of $2,551,799, or $23 70 for each enrolled child. So rapidly has this army of school children increased of late that it has been difficult, especially in this city, to provide accommodations for them. In less than ten years this army will have been transferred to the working and producing forces of the State. But there will be in their places another army, more than two hundred thousand strong, and the educational revenue will have been correspondingly increased.

Another fact worthy of note is that the public schools of this State have been greatly improved of late years, especially those in the rural districts and small towns. Many of them have been graded, a better class of school buildings have been erected, and more competent teachers have been employed. The great majority of these children will have no other tuition than such as they find in the public schools. That instruction ought to be the best which can possibly be secured. The applications for places as pupils in the Normal School have greatly increased of late, even beyond the present capacity of that institution. These pupils are trained as teachers. The applications for teachers at the Normal School are greatly ahead of the supply. All the available resources of the State seem to be inadequate to furnish teachers and seating room for pupils in the public schools as fast as demanded.

One other fact remains to be noticed. The public school system culminates in the University. Within the past year that institution has been subjected to more ungenerous and partial criticism than all other educational institutions in the State. It has been made the target for all the random missiles and slungshots, which responsible and irresponsible persons have chosen to launch at it. A thousand stories have been put afloat, apparently designed to lessen the confidence of the public in its value and stability. But during all this time there has been a steady increase of effective work, and a notable increase in the attendance of students. The attendance is larger to-day than ever before. More and better work is done in the aggregate, and all the educational machinery of the institution is more perfect than at any previous date. There are open doors, free tuition, and a place for every young man and woman in the State who wants to learn more than can be acquired in the public school.

When all these facts are grouped together, we get a clearer idea of what the public school system is doing for the youth of California. The private schools are also doing a good work. But, if education were left exclusively to the latter, more than half of the children in California would be deprived of even an elementary education. Before all the accumulations of capital, before the great fleet of wheat laden ships, we place this grand army of children more than a hundred thousand strong, and that system of education which makes them the hope and the pride of the State.—*S. F. Bulletin.*

COMPULSORY EDUCATION.—It is stated that the Compulsory Attendance law of Connecticut has been attended by an increase of the number of pupils in the schools by about 3,500, of whom one fifth is the natural increase from population. The law has therefore brought in about 2,800 from the haunts of ignorance to instruction, and still leaves out about 1,200 by reason of parental neglect, and 5,680 in employment.

FOREIGN.

JAPANESE—The Educational Department of Japan has decided to send abroad annually an average of about seventy picked students, who will have received a good rudimentary education in all branches of a foreign education before leaving home, thus enabling them to make the best use of their time when abroad.

A SPECIAL institution for the training of women as teachers is to be established by the Russian Government.

IN thirty-five years England has increased her expenditure for public schools, from £30,000 to £1,365,852. The schools have accommodations for 4,000,000 pupils.

IN Scotland the salaries for certificated teachers, male and female, are respectively $500 and $200 per year.

BOOK NOTICES.

AN INTRODUCTION TO THE STUDY OF GENERAL BIOLOGY. By Thomas C. MacGinley. New York: G. P. Putnam's Sons. Sacramento: A. S. Hopkins & Son. Price, 75 cents.

This book belongs to Putnam's Elementary Series, and is designed for the use of schools and science classes. The book has been prepared in accordance with the Syllabus of Science and Art Department, South Kensington, Great Britain.

Biology is the science of life, and considers the different forces and laws of life under their various manifestations. In order to understand properly and fully these forces and laws, it is best to begin with the simplest forms of animal and vegetable life in which they are manifested, and then to rise to those higher structures, in which life presents the greatest complications. The elementary laws of life are manifested, in their various complications, in a few well marked typical beings—beings with which all others may be compared, and around which, as centres, they may be conveniently grouped. Hence the best preparation for the study of Biology is to become first thoroughly acquainted with the characters of these typical beings. These typical beings are to be studied in order to show the progressive differentiation in structure and function from the lowest unicellular plants or animals in which each cell is an individual being, living *by* and *for* itself, to the highest organized plant and animal, in which we have a composite fabric developed, "which is made up of a number of distinct organs, each of them characterized by specialties, not merely of external form but of intimate structure, and each performing actions peculiar to itself, which contribute to the life of the plant" or animal, *as a whole*. A study of the progressive differentiation in structure, and the resulting complexity of function, is the key to the study of Biology. In an Introduction to Biology then, the subject matter and the treatment must be of such an order that this progress in differentiation is clearly placed before the pupil. And yet this is the very point in which the book under review is most lacking. The organizations chosen to exhibit the differentiation in structure and function of animals and plants, are well enough selected, and the form, function, and minute structure of every part of each organism, are clearly enough stated, but the comparing of one organism with another is very much

neglected; and nowhere find we indicated how and in what each organism presents a typical structure and a resulting typical life. A better book than the one before us might have been compiled from Dr. Carpenter's work on "The Microscope, and Its Revelations." The poor illustrations of the book make it still more unfit for a text book in the elements of Biology.

A HIGHER ARITHMETIC. By G. P. Quackenbos, LL. D. Upon the Basis of the Works of Geo. R. Perkins, LL. D. New York: D. Appleton & Co.

This work is "designed for the use of high schools, academies, business colleges, advanced classes in private and grammar schools, and all who desire a thorough preparation for the duties of the counting-house, and have had such previous training as will enable them to enter on a higher course intelligently and profitably." But in order to make the work complete in itself, it purposes to furnish "in addition to a comprehensive course in all the higher topics, a brief summary also of the elementary parts of the subject." Thus we are met at the very outset with the inevitable definitions of *a unit*, *a number*, *a quantity*, *mathematics*, *arithmetic*, etc.; notation and numeration come next; then addition, subtraction, and so on to the end of the book. The author excuses this repetition of topics with which the student must already be familiar, by the plea that it is easy, while laboring in the more advanced problems, to forget the more elementary subjects of arithmetic. Yet we cannot conceive how a student can be presumed to forget all about addition, for instance, so that his mind must be re-introduced to the subject in a truly primary school style, while at the same time he is presumed to need no re-introduction to subjects with which he might reasonably claim but very limited acquaintance. But the "padding" of the book is not limited to the introduction of mere elementary work. Matters are considered which either belong not to arithmetic at all, or should find a place only in a work on the "Curiosities of Arithmetic." For instance, what practical or pedagogical purpose can it serve to speak of the Binary and the Duodecimal systems of notation, and to require the student to write numbers according to these systems? Where is the use of requiring the student to find the numbers whose difference is XCVI, and their sum MDCCLXXII? Who, at the present day, computes in Roman numerals? Instead of such trash, it would, for instance, have been profitable to introduce properly the subject of book-keeping, and not to assume that the student is already fully acquainted with the elements of this study. Now, the student is treated as a member of a primary school, and at the next moment as a well advanced student of a business college.

"Conciseness and clearness in rules and definitions have been aimed at throughout." For the sake of comparison, we should like to see the author aim at "diffuseness and ambiguity in rules and definitions." Perhaps we might give a practical illustration of "conciseness in criticism," by condensing our whole opinion into, "written by Mr. Quackenbos."

SHAW'S NEW HISTORY OF ENGLISH LITERATURE. Prepared on the Basis of "Shaw's Manual." By Truman J. Backus, A. M. New York: Sheldon & Co.

This book is a revision of the *Complete Manual of English Literature*, written by Dr. Smith, upon the basis of Shaw's original *Outlines of English Literature*. The present revision attempts to improve the logical arrangement of the original work; to correct the lack of unity in several chapters, and to simplify Dr. Shaw's

involved style. In addition to this, Dr. Backus discusses more fully the "Old English" and "Middle English" literatures; uses freely short and striking quotations from the works of the present English and American critics; collects references to the best collateral readings upon the topics considered, and introduces a few simple diagrams as an aid to the student in remembering important classifications of authors. Another new feature is that the criticisms upon the more important authors are printed in larger type than the criticisms upon the minor authors. By this means a guide is furnished in a selection of material when a thorough study of the whole book is not admissible. But we think Dr. Backus is hardly justified in exalting, in this manner, Byron above Moore, Wordsworth, and others; and to indicate, by using long primer, the last time, in the case of Byron, that all what follows after him may be judiciously omitted. In fact, if the whole book was revised by a thorough critic, its value as a critical history of English and American literature would be materially improved. We know of no bar to this; for if it is permitted to revise the arrangement and style of the author, it must be permissible to have some of his crude and biased criticisms corrected by a more liberal and competent critic.

SCIENCE PRIMER No. VI: PHYSIOLOGY. By M. Foster. New York: D. Appleton & Co.

"Primer" is certainly a misnomer when applied to a book like the one before us now. True, it is compact in size, and contains only 132 pages, 32mo., yet into this narrow limit is crowded material which belongs exclusively to a far more advanced text book. Thus, if by "Primer" we understand a book introductory to the elements of physiology (which is all the author claims for the book), the learner's attention should certainly not be called to the microscopical structure and chemical composition of the blood, the chemical changes the blood undergoes in somatic and pulmonary circulation, the chemical and physiological changes of food, etc., but should be confined exclusively to the general structure of the body, as composed of certain materials, the organic structure of the body as composed of certain organs, and the functions of the body as exhibited in the actions of these organs. In addition to this, the general laws of hygiene should be taught. The latter is not considered at all in the present Primer.

A MANUAL OF METALLURGY. By Wm. Henry Greenwood, F. C. S. Vol. I. Fuel, Iron, Steel, Tin, Antimony, Arsenic, Bismuth and Platinum. New York: G. P. Putnam's Sons. Sacramento: A. S. Hopkins & Son. Price, $1 50.

The present volume belongs to Putnam's Advanced Science Series. It is based upon the metallurgical syllabus issued by the Science and Art Department, South Kensington, Great Britain. The work is, therefore, primarily designed to prepare students for the advanced stage of the examinations held by the Science and Art Department. The author gives a condensed and succinct account of the theory and practice involved in the varied operations, comprised in the metallurgy of those metals, which are of general application to the arts and manufactures; and the general student of metallurgy and mining engineering, and also those practically engaged in metallurgy or mining, will find the volume a useful auxiliary and resumé of Metallurgy. The latest advances in the science have been duly noted and incorporated in the work.

ST. NICHOLAS FOR DECEMBER

Opens with a handsomely illustrated article on the celebrated "Garden of the Gods," in Colorado. Among the other instructive articles are "The Boy Astronomer," by Hezekiah Butterworth; "The Chickadees," by Harvey Wilder; "African Fashions," by Olive Thorne; "Altorf and William Tell," by Emma D. Southwick; and "Holiday Harbor," an excellent article by Mrs. S. B. C. Samuels, showing the boys and girls how to build a city, with all the public buildings, steamboats, railroad trains, etc., necessary for its prosperity.

The stories in the number are, many of them, remarkably good. "Mabel's Troubles," by B. E. Woolf, is a bright fanciful story, but better adapted to the past, than the present, for the "B-a, ba, b-e, be, b-i, bi" system of teaching reading, is certainly a thing of the past in schools and families which can appreciate a juvenile like *St. Nicholas*.

The poems are excellent. The announcements for the January issue, which will be the Holiday number, will keep the young folks on the *qui vive* for the next number.

THE LIVING AGE

Publishes its prospectus for 1875 in another part of the TEACHER. We club our journal with this best and oldest eclectic, for $8 00—the regular subscription price of the *Living Age* alone.

As will be seen, our staid contemporary has been seized by the prevailing "Merging" epidemic, and has absorbed no less a periodical than *Every Saturday*. This leaves the *Living Age* without a rival, if it ever had a rival, which we doubt.

THE PROSPECTUS FOR HARPER'S MAGAZINE, HARPER'S WEEKLY, HARPER'S BAZAR,

Is also published in this number. We need not call attention to the sterling worth of these periodicals, but desire only to state that we club the TEACHER with one, two, or all three of these periodicals at the following rates: the TEACHER and the Magazine, or Weekly, or Bazar, for $5 00; the TEACHER and any two of these periodicals, for $8 00; the TEACHER and all three of these periodicals, for $11 00.

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HARPER'S MAGAZINE.

ILLUSTRATED.

Notices of the Press.

The ever increasing circulation of this excellent monthly proves its continued adaptation to popular desires and needs. Indeed, when we think into how many homes it penetrates every month, we must consider it as one of the educators as well as entertainers of the public mind, for its vast popularity has been won by no appeal to stupid prejudices or depraved tastes.—Boston Globe.

The character which this Magazine possesses for variety, enterprise, artistic wealth, and literary culture that has kept pace with, if it has not led the times, should cause its conductors to regard it with justifiable complacency. It also entitles them to a great claim upon the public gratitude. The Magazine has done good and not evil all the days of its life.—Brooklyn Eagle.

"A Complete Pictorial History of the Times."—"The best, cheapest, and most successful Family Paper in the Union."

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Its articles are models of high-toned discussion, and its pictorial illustrations are often corroborative arguments of no small force.—N. Y. Examiner and Chronicle.

Its papers upon existent questions and its inimitable cartoons help to mold the sentiments of the country.—Pittsburgh Commercial.

"A Repository of Fashion, Pleasure, and Instruction."

HARPER'S BAZAR.

ILLUSTRATED.

Notices of the Press.

The Bazar is edited with a contribution of tact and talent that we seldom find in any journal; and the journal itself is the organ of the great world of fashion.—Boston Traveller.

The Bazar commends itself to every member of the household—to the children by droll and pretty pictures, to the young ladies by its fashion-plates in endless variety, to the provident matron by its patterns for the children's clothes, to paterfamilias by its tasteful designs for embroidered slippers and luxurious dressing gowns. But the reading matter of the Bazar is uniformly of great excellence. The paper has acquired a wide popularity for the fireside enjoyment it affords.—N. Y. Evening Post.

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THE

CALIFORNIA TEACHER.

JANUARY 1875.

VOL. XII. SACRAMENTO. No. 7.

[*For the California Teacher.*]

BOTANY FOR SCHOOLS.

V. THE SOLANACEOUS FAMILY.

All dicotyledonous (two seed-leaved) plants are divided into polypetalous, monopetalous and apetalous. To the polypetalous division belong all plants having a corolla consisting of several separate petals. Four families of this division were treated of in our previous articles. With the present, we begin to illustrate a family belonging to the second division, the monopetalous. To the monopetalous division belong all plants having a corolla whose petals are all coherent, forming a tube of greater or less extent. Of the third, the apetalous division, we shall treat hereafter.

From the harmless natural orders, so far considered in our illustrated articles, we now turn our attention to one, the properties of which are often dangerous. Henbane, Nightshade, Tobacco, Thorn Apple, and the half fabulous Mandrake, form, with a number of other plants (Tomato, Potato), a large natural order, the prevailing quality of which is to be poisonous. Many of them are common wild plants, and none more so than the species called Black Nightshade (*Solanum nigrum*), which is sure to spring up wherever a spot is neglected and suffered to become waste. We select this common plant to explain the general character of the Nightshade family. If the nightshade, however, cannot be had, any other plant named in this article may be substituted therefor.

The Nightshade Tribe.
5.
2x1
3
a
2x
4
1
5
Black Nightshade.

Black Nightshade is a plant with broadly lance-shaped leaves, slightly toothed at the edge, and seated alternately upon the stem. Its flowers consist of a short five-toothed calyx, of a monopetalous corolla, with five equal divisions (fig. 1), of five equal stamens, and of an ovary (fig. 2 * *) with two cells, in each of which are a number of ovules. The style of the ovary is thick and shaggy at the bottom, and terminated by a thickened undivided stigma. The fruit is a small thick berry, containing two cells, and a number of yellowish seeds whose skin is covered closely with little pits (fig. 4); in the inside is an embryo, which is coiled up upon itself in the middle of a quantity of fleshy albumen (fig. 5). Of these characters, the most essential ones are the superior ovary with two cells, the regular flower, and the alternate leaves.

The genus Solanum is known in its family by the anthers opening by two holes or pores at their points (fig. 1, *a*); besides Black Nightshade, it contains the Bitter-Sweet (*S. Dulcamara*), whose red and tempting berries present a dangerous temptation to children; the Love Apple or Tomato (*S. Lycopersicum*); the Egg-plant or Aubergine (*S. Melongena*), whose fruit, when fried in slices, forms a delicacy in French cookery; and above all, the Potato (*S. tuberosum*), Here is a singular assortment of eatable and poisonous plants in the same genus; but in truth, the fruit of these is in all cases deleterious till it is cooked. Egg-plants are washed and fried before they are eaten. The fruit of the Potato is notoriously unwholesome; and if its roots are not so, that circumstance is to be ascribed in part to their being composed almost entirely of a starchy substance, which in no plant is poisonous, if it can be separated either by heat or by washing from the watery or pulpy matter it may lie among.

California has but very few indigenous plants belonging to the Solanaceous family. Those found in waste-places and in our gardens were introduced from other countries, either intentionally or by chance. To the latter belong Thorn Apple (*Datura Stramonium*), so celebrated for its narcotic properties; it is distinguished by its fruit being dry and covered with stiff spines. This obnoxious plant is fast spreading all over this State.

Solanum umbelliferum is the only conspicuous and indigenous

plant of this family likely to attract the beginner on his excursions. It is found on the Coast Ranges, as well as on both slopes, eastern and western, of the Sierras. It is a low semi-herbaceous shrub, with dark green leaves and dark blue flowers, borne in racemes at the end of the branches. We possess also a species of wild tobacco, with long tubular flowers of a greenish-white color.

EXPLANATION OF PLATE—A twig of Black Nightshade. 1, a corolla laid open; *a*, the holes through which the pollen is discharged by the anthers. 2 *, the pistil and calyx. 2 * *, a horizontal section of the ovary, exhibiting the numerous seeds lying in the two cells. 3, a cluster of ripe fruit. 4, a seed. 5, the same divided perpendicularly, showing the manner in which the embryo is coiled up.

MANUAL OF INSTRUCTIONS REGARDING THE COURSE OF STUDIES.

§6. INSTRUCTION IN LANGUAGE (Continued).

2. *Syntax.*—As already stated, under syntax we include the elements of composition—the clear and grammatical construction of sentences. Syntax is usually defined as "treating of words combined in sentences," or, as Goold Brown expresses it, as treating "of the relation, agreement, government, and arrangement of words into sentences." Strictly speaking, grammar should concern itself only with the analysis of sentences, that is, with the resolution of sentences into their constituent parts, *members, clauses, phrases* or *words*, and to point out their several relations and powers. The synthesis of sentences belongs properly to composition. In practice, however, grammarians consider both the analysis and the synthesis of sentences; and reciprocally, writers on composition have treated of the synthesis of sentences too much as *grammarians* and rhetoricians, instead of as *logicians* and rhetoricians. For a grammarian should consider only the *office* of a word as a noun, adjective, etc.; a writer on composition, on the contrary, should consider only the *power* of the word to express the idea intended to be conveyed. A grammarian should consider a sentence only as composed of certain parts, be these considered as *members, clauses, phrases* or *words;* a writer on composition should consider a sentence simply as the expression of a

thought. A grammarian should consider a sentence simply as "an assemblage of words, making complete sense;" a writer on composition should consider a sentence, not only as an "assemblage of words, making complete sense," but also as a part of a composition, that is, the sentence must be considered in its relations to the preceding and succeeding sentences. In syntax it is, therefore, the duty of the grammarian to analyze the structure of sentences, and to devise such definitions and rules as will classify the different kinds of sentences. But the grammarian can not consider the use of the different kinds of sentences in a discourse; this consideration belongs to the writer on composition; and it is the latter's duty to determine the occasion of the use of the different kinds of sentences. In accordance with our scheme heretofore outlined, we must consider both the form or grammar, and the matter or composition of a sentence; that is, we must consider a sentence first, as composed of certain parts, and secondly, as the expression of a thought.

There is a bewildering diversity among grammarians regarding the classification of sentences. Goold Brown, for instance, recognizes only two kinds of sentences—simple and compound. Other grammarians recognize three kinds of sentences—simple, complex and compound. But whether two or three kinds of sentences are recognized, hardly two grammarians agree in the determination of the comprehension of the different kinds of sentences. Before entering, however, upon the classification of sentences, we must determine what is to be understood by "a sentence."

Goold Brown defines a sentence as "an assemblage of words, making complete sense, and always containing a nominative and a verb." The ambiguity of this definition will be seen when we consider the various meanings which are attached to the word "sense." Goold Brown, by closing his definition with "and always containing a nominative and a verb," limits the meaning of the word *sense* to sentiment or judgment, and hence directs that distinct sentiments must be treated in separate sentences. But that he holds predication to be the real distinguishing characteristic of a sentence, may be seen from the fact that he calls a clause a sentence, for the only reason, as far as we can see, that the clause contains a predication, *i. e.*

a nominative and a verb. And yet a clause is never "complete in sense," and hence can not be a sentence, according to Brown's definition, or his definition of a sentence is not correct. Some grammarians define a sentence simply as "such an assemblage of words as makes complete sense," and only teach by implication that such an assemblage must always contain at least a subject and a verb. The writers on composition who accept this definition last given, teach that "as soon as a passage makes complete sense, if it is at the same time independent of what follows in construction and not closely connected with it in meaning, the sentence is complete. The degree of closeness in the connection is a matter which must be left somewhat to individual judgment."

The ambiguity in the above definitions of a sentence prevents the learner from grasping the true character of a sentence, and this again leaves him without a criterion to judge of the quality of a sentence, and to guide him in the construction of sentences. If, however, a sentence is defined as an assemblage of words, which is *complete as expressing a thought*, we do not only avoid all ambiguity, but we also explain the constitution of a sentence, and this furnishes the learner with a criterion and a guide in the construction of sentences. We shall therefore define a sentence as an assemblage of words expressing a complete thought; and shall lay down as the first rule in composition, that a sentence ought to express one entire thought; and that different thoughts ought to be separated by placing them in different sentences. We may remark, parenthetically, that we mean by a sentence what is sometimes called *a period*, that is, a complete sentence closed by a full stop or period.

When we express a *thought* we express a judgment, that is, we affirm or deny one thing of another. Whenever we affirm, deny or ask (affirmatively or negatively) something of an object, person or place, the complete assemblage of words used in doing this, is a sentence. Hence we have *the thing spoken of*, and *the statement affirmed, denied or asked* of the thing; the former is called the subject, the latter the predicate. Now when we think or speak of an object we may confine ourselves to one of its attributes, or we may consider more than one of its attributes; or we may consider all its attributes. For instance, we have before us a leaf. Confining ourselves to the considera-

tion of its color, we say: "The leaf is green." This is a complete thought, and the words used in expressing it form a sentence. If we examine the form of the leaf, we may say: "The leaf is oval." Here we have again a complete thought, and the words used in expressing it form a sentence. Thus, in considering one after another the different characters of the leaf, we may have the following separate thoughts, each of which is complete in and by itself, and we shall have, consequently, as many separate and complete sentences: The leaf is simple; The leaf is petiolate; The leaf is exstipulate; The leaf is feather-veined; The leaf is irregularly-dentate; The leaf is ovate-acuminate; The leaf is green; The leaf is smooth; The leaf is cauline; The leaf is opposite; etc.

But we can think and express these several complete thoughts only when we distinctly think of the leaf, 1st, as an object having a single blade; 2d, as an object having a stalk; 3d, as an object having no stipules; etc. In other words, the attention is each time directed to only a single character of the leaf, and we affirm that the leaf is possessed of this character. But as every object is a complement of characters, it will be only under certain circumstances that our attention is directed to only one character of an object. When, however, our attention is so directed, the affirmation or negation of the possession of this character on the part of the object, forms a complete thought, and its expression in words will give us a complete sentence.

We have stated that an object is a complement of characters. In thinking of an object, we may consider the full complement of characters, or only a partial complement. Thus in thinking of a leaf, we may consider it only as composed of certain parts, as a blade, a petiole and stipules. Considering the leaf from this view, our complete conception is the leaf as an object having a blade, a petiole, and two stipules. And our thought will not be complete until we think of the leaf as having a blade, a petiole, and two stipules; and the words used to express this complete thought, form again a sentence. If we go a little further and consider the leaf not only as having the parts just considered, but also as having a margin, an apex, a base, a set of veins, etc., our conception of the leaf will be more comprehensive, and our thought will not be complete until all these

characters are considered; and it may happen that the several thoughts given above as independent of each other, and each complete in itself, are only parts of one complete thought, and to express this thought we must combine the several separate sentences into one sentence which may stand thus: the leaf is simple, petiolate, exstipulate, feather-veined, irregularly-dentate, ovate-acuminate, green, smooth, cauline, opposite, etc. Here we have again a complete sentence, expressing but one complete thought.

As a recapitulation we may consider the following description of a leaf:

1. The leaf is simple.

2. The leaf is simple, petiolate, stipulate, net-veined, feather-veined, entire, abruptly acuminate, broadly oval. The petiole is short, bordered by the blade. The stipules are free.

3. The leaf is simple, petiolate, stipulate, net-veined, feather-veined, entire, abruptly acuminate, broadly oval; the petiole is short, bordered by the blade; the stipules are free.

In (1) we consider the leaf only in regard to a single character, as composed of one blade or more. In affirming the leaf to be simple, we affirm that the leaf has but one blade. This affirmation is a complete thought, and the words used to express this thought form a complete sentence. The occasion for confining our attention to this single character of the leaf, may occur, for instance, in teaching numbers.

In (2) we consider the leaf as having a blade, a petiole, two stipules, a set of veins, a margin, an apex, a certain form. In this case, our conception of the leaf will not be complete until *all* these characters are taken together; and our thought will not be complete until the leaf has been examined in regard to all these characters. This is done when we affirm the leaf to be simple, petiolate, etc. The words used to express this complete thought form a sentence. After having considered the leaf, we consider the petiole as a separate object, and describe it in regard to its length and connection with the blade of the leaf. The determination of these two characters forms a complete thought, and the words used to express this thought form a complete sentence. Next we consider the stipules as separate objects, and describe them in regard to only one character. In determining this character we have again a complete

thought, and its expression in words gives us a complete sentence. In (2) we have, therefore, three complete thoughts, and consequently, three sentences. The occasion for describing a leaf in the above manner, will arise, when we consider a leaf *per se*, and desire to describe it fully.

In (2) we considered the petiole and stipules as independent of the leaf, as parts for themselves. In (3), however, we consider the petiole and stipules as belonging to the leaf, and our thought, therefore, will not be complete until we have fully considered all the characters of the leaf, including the stipules and petiole. In (3) the three separate thoughts of (2) form, therefore, only one complete thought; and the three sentences given in (2) will give only the one sentence of (3). A leaf will be thus described, when we desire to describe a whole plant. For a plant is generally considered as composed of roots, a stem, leaves, etc. And each of these parts forms a single conception, and the complete synthesis or analysis of this conception forms a complete thought, and this thought expressed in words forms a sentence.

A case may occur, and does occur in botanical descriptions, in which a whole plant is considered as a single conception, and the complete analysis of this conception, which will include a full description of the plant, forms only a single thought, and this thought expressed in words forms a sentence. Thus in describing the *Euphorbia Wrightii*, we have the following single sentence: stem herbaceous from a somewhat ligneous base, erect, much branched; leaves opposite, sessile, narrowly lanceolate-linear, entire; involucre solitary, pedunculate, mostly terminal or in the uppermost forks of the stem, pubescent; glands transversely oblong, entire, with a large petaloid broadly obvate denticulate appendage; capsule very minutely papillose-pubescent; seeds glabrous. This description is taken, *verbatim et literatim*, from a botanical work. It is by no means a full description of the plant; for by placing the plant in a certain genus, and giving it the specific name *euphorbia*, the mind has already endowed it with certain characters which it would be superfluous to enumerate. The above description simply shows the characters in which this particular species of euphorbia is distinguished from any other species of euphorbia. The complete conception of the plant includes all its characters,

not only as a *Euphorbia Wrightii*, but also as a *euphorbia*, and also as a *euphorbiaceæ*. For a botanist in perceiving a euphorbia, has no complete conception of the plant until he perceives all its characters. But for convenience of thinking, he classifies these characters into three or more classes: 1st, those characters which the plant has in common with all the plants belonging to the order of *euphorbiaceæ*; 2d, those characters which it has in common with all the plants belonging to the genus *euphorbia*; and 3d, those characters which differentiate the plant from all other plants. The classification of characters might have been more extended if we have considered the characters which the plant has in common with all vegetables, with all exogenous plants, with all dicotyledenous plants, etc. But the perception of the plant is not complete until all these characters have been considered; and in thinking of the plant we must consider all these characters, and the expression in words of this thought alone will form a complete sentence.

Now all our perceptions of actual or ideal objects and phenomena, to be complete, must include the perception of all the characters belonging to any specified object or phenomenon. But in thought, we may confine our attention to a single character, to a set of characters, or to all the characters. Thus a horse may be considered simply in regard to its *size as a horse;* it may be considered *as a horse*, that is, as an animal having certain characters possessed by all horses; it may be considered as a mammal; it may be considered as a vertebrata; it may be considered as an animal. In thinking of a horse under these different conceptions, our thoughts are different; but each thought is co-extensive with the conception; and each thought can be expressed in only one sentence, and this sentence will not be complete except it expresses the complete thought. The practical impossibility, however, of thinking of any object by considering each of its individual characters, leads the mind to form concepts; thus in thinking of an object called a horse, by giving the object the name of *horse*, we think of it as possessed of all the characters the object has in common with organized beings, animals, vertebrata, mammals, etc., and we confine our attention exclusively to its characters as a *horse*, that is, the characters which distinguish it from all other animals which are *not horses*.

The above rather metaphysical explication of "thought," was necessary, as thereby we are furnished with the first criterion to guide us in composition. For in judging of a composition our first care must be to ascertain in what manner the writer conceives the object—be this a plant, an animal, a phenomenon, a scene, a passion, a conflict, etc.—which he describes or of which he speaks. In like manner, if we desire to describe an object, our thoughts, and consequently our sentences, will be shaped by our conception of the object. Every thought must be co-extensive with the concept about which we think, and as every sentence must express a complete thought, but only *one* complete thought, the character of our sentence will depend upon the character of our concept. As an illustration let us consider the following example:

1. "She said and struck; deep entered in her side
The piercing steel; with reeking purple dyed,
Clogged in the wound the cruel weapon stands,
The spouting blood came streaming o'er her hands.
Her sad attendants saw the deadly stroke,
And with loud cries the sounding palace shook.
Distracted from the fatal sight they fled,
And through the town the dismal rumor spread.
First from the frighted court the yell began,
Redoubled thence, from house to house it ran;
The groans of men with shrieks, laments, and cries
Of mixing women, mount the vaulted skies."
[*Æneid*, Book 4, l. 663.

2. And there was mounting in hot haste; the steed,
The mustering squadron, and the clattering car
Went pouring forward with impetuous speed,
And swiftly forming in the ranks of war;
And the deep thunder, peal on peal, afar,
And near, the beat of the alarming drum
Roused up the soldier ere the morning star;
While throng'd the citizens, with terror dumb,
Or whispering with white lips, "The foe! they come! they come!"
[*Childe Harold*, The Night before Waterloo.

In each of these extracts, the results of an incident are described. In the first case, the incident is given in order to make the context clear; the results springing from this incident are italicized. In the second case the incident is omitted, in order to avoid the quoting of three stanzas. In the first case we have three capital objects, as indicated by the braces, presented to the attention of the reader.

Dido's suicide is such an important event, that the mind will naturally dwell upon it; and this it can do only by distinguish-

ing the several circumstances connected with the event. Hence the mind passes so slowly from the suicide to the consternation of the attendants, and then to the flight of the attendants, and then to the lament of the citizens, that each of these circumstances is dwelled upon long enough by the mind to form a complete thought, and each of these circumstances must therefore be expressed in a separate sentence. This leisurely survey of the different circumstances permits the mind to note also some of the parts of which each circumstance is composed. This could not have been done if the mind had taken a hasty survey; the whole incident, with the circumstances connected with it, would have then been viewed as only one event, and would have thus formed only a single thought, and would have to be expressed in a single sentence. Such is the case in the second example. The particulars composing this scene are more numerous than in the first example; yet the mind sympathizes so intimately with the general uproar, and the consternation, which has seized so suddenly upon the city, that it has no time to note leisurely each individual particular, but hurries on from particular to particular, until all the particulars are blended into but one confused scene of turmoil, and the mind is filled by but one thought. If the danger had not so suddenly burst upon the city, and its revelry, the marshaling of the army, and the general preparation for the impending battle would have been so much more deliberate that such a scene of confusion and hurried arming, would not have occurred. Then the mind would have noted a lapse of time between the perception of two particulars, and would have then considered each particular in a separate thought. And this gives us the key to the individualizing of our thoughts. Whatever claims the mind's attention at any one time, forms a thought. Thus in the first example, the mind's attention is claimed first by Dido's suicide, then by the consternation of the attendants, etc.; and the mind distinctly notes that these particulars happen *successively* and *not simultaneously*. But in the second example the mind conceives the different particulars to happen *simultaneously*, and *not successively*, and hence the mind perceives all the particulars at once. In the case of the leaf, instanced *supra*, in the first case, the mind passes *successively* from one character to another, for the mind considers not the leaf, but the different characters

of the leaf. In the second case the *leaf* is considered, and as the leaf can be perceived only in so far as we perceive the *characters* of the leaf, our consideration of the leaf is nothing but a consideration of the complement of characters which we call leaf, and hence the characters of the leaf are not considered successively, but simultaneously. Again, in the case of a scene viewed leisurely, the mind passes successively from one element of the scene to another; and the different elements of which the scene is composed, are not obtruded upon the mind at one and the same time. If the same scene is viewed, however, from the window of a swiftly moving railroad car, the several elements of the scene will obtrude themselves upon the mind simultaneously, and the whole scene will be considered in a single thought.

Thus far we have considered "a thought" as the expression of a judgment. But we can judge, that is, affirm or deny something of an object, only when we can directly determine the character of the object. Now this is not always possible. For instance, we desire to determine whether man is a free agent. We cannot directly affirm or deny that man is a free agent, for in either case the *reason* for our judgment would be demanded. In order to determine whether a man is a free agent, we must determine what is meant by *free agent*. Now a free agent is a morally responsible agent. We must next determine whether man is a morally responsible agent. If we judge man to be a morally responsible agent, we judge man to be a free agent. For:

Every morally responsible agent is a free agent;
Man is a morally responsible agent;
Therefore, man is a free agent.

or

Man is a morally responsible agent;
Every morally responsible agent is a free agent;
Therefore, man is a free agent.

All philosophers and theologians are agreed in affirming "every morally responsible agent to be a free agent;" but all philosophers are not agreed whether "man is a morally responsible agent." To prove or disprove this latter affirmation or judgment, tomes upon tomes have been written, and controversy upon controversy has raged for centuries. Assum-

ing that, however, "man is a morally responsible agent," and knowing that no one will controvert the assertion that every "morally responsible agent is a free agent," we might say:

Man is a morally responsible agent, therefore he is a free agent.

or

Man is a free agent because he is a morally responsible agent.

or

Man, being a morally responsible agent, is a free agent.

We might form still different sentences, but the three given will be sufficient for illustration. In each of these three sentences we express an "act of reasoning." Every act of reasoning consists of three judgments, two of which are the premises, and the third the conclusion. The former two must be established before we can draw the conclusion; but being established, the conclusion is self-evident. When one of the premises is admitted, it is generally not expressed; but in a complete act of reasoning, both the two premises and the conclusion must be expressed.

To illustrate more fully the remarks just made, let us take the following example: We assert that John must go to jail; no one will agree with us until we have given *the reason* for this assertion; if we add, however, "because he has committed a theft," all will be satisfied; for all civilized people agree that whoever commits a theft should be punished by imprisonment. The complete act of reasoning will stand, however, thus:

All who commit a theft, must go to jail;
John committed a theft;
Therefore John must go to jail.

Our conclusion will depend upon the correctness of the first premise. This might be denied, and is denied perhaps by some savages; but once admitted, and the fact of John's theft established, our conclusion must be admitted.

As already stated, very frequently one of the premises is omitted. If, however, the act of reasoning, that is, all three judgments, is fully expressed, we need not necessarily adhere to the order of expression heretofore given. For, to recur to our first example, we may say:

Man is a free agent, because he is a morally responsible agent, and every morally responsible agent is a free agent.

Man, being a morally responsible agent, and every morally responsible agent being a free agent, is a free agent. etc.

It will be seen from the above, that an act of reasoning, even if fully expressed, may be expressed in very different forms.

We come now to the question: in how many sentences must an act of reasoning be expressed; and our answer is: every act of reasoning must be expressed in one, and only one sentence; just as every judgment must be expressed in one, and only one sentence. It may be necessary to establish one or both of the premises, and this may consume pages upon pages, and volumes upon volumes. But in expressing the conclusion, one or both of the premises must also be expressed; *both must* be expressed in a complete expression of the act of reasoning. To give a concluding example, we select a sentence we just have made use of. We stated above "that if the act of reasoning, that is, all three judgments, is fully expressed, we need not adhere to the order of expression heretofore given." This sentence expresses an act of reasoning. The first premise is: if the act of reasoning is fully expressed; the second premise (suppressed) is: an act of reasoning may be expressed fully in some of following different ways; the conclusion is: in fully expressing an act of judgment we need not adhere to the one particular mode of expression heretofore used, but may use any of the expressions given in the second premise. The second premise is not only suppressed, but must be established. We did this in the next sentence, beginning "for, to recur to our first example, we may say," etc.

As one of the premises may be suppressed, in expressing an act of reasoning, so the conclusion is sometimes suppressed. But instead of wearying our readers with examples of this suppression, we simply draw their attention to the introduction of the participial clause into some of the above sentences in order to express one of the premises in an act of reasoning, and with this pass on to other matters.

Heretofore we have spoken of judgments, and of acts of reasoning. Both are included under the general term *thought*. We have thus far considered what is meant by *a thought*. But thoughts do not occur isolated and independent of each other; they are only the elements of a ceaseless succession or train of thoughts; "one thought suggests another, which again is the

cause of exciting a third, and so on." Each thought forms a link of a continuous and uninterrupted chain. "Thoughts are associated, that is, are able to excite each other." This is not the place to explicate the "Association of Ideas;" we can draw attention only to the fact that a composition, oral or written, represents the train of perceptions and ideas passing through the mind of the speaker or writer. In thinking we frequently omit some portions of the train, or pass so lightly over them that we are not conscious of these portions; however, in giving expression in words to this very same train of thought, it may be necessary to supply these portions in order to make ourselves understood. Again, any particular thought may give rise, and generally does give rise, to a number of associated thoughts; and we must therefore indicate to the hearer or reader which particular thought is to follow in our train of thoughts.

These connecting links—as we may call them—between the principal or capital thoughts may be indicated by a single word, a phrase, a clause or a sentence. Even punctuation marks, and especially quotation marks, frequently serve to indicate to the reader a transition in the train of thoughts.

It will now appear that a sentence as the expression of a thought, may contain a judgment or an act of reasoning, or either of these with the addition of some connecting link. Thus in the following extract that portion beginning with "such murmurs," etc. is the thought the poet desires to express. To lead the reader's attention from Satan, whose speech has but just occupied the reader's attention, to the effect of the speech upon the assembly of fallen angels, the poet makes use of the clause "He scarce had finished." The word *then*, or *thereupon*, would have served the same purpose; but the use of the clause is preferable, as it serves the further purpose of indicating to the reader that the assembly has scarcely been able to suppress its feelings till the conclusion of the speech.

> "He scarce had finished when such murmurs filled
> Th' assembly, as when hollow rocks retain
> The sound of blustering winds, which all night long
> Had roused the sea."

The other clauses of the above sentence, define or describe the nature of the murmur.

If we now return to the original question of the classification of sentences into simple, complex and compound it will appear that such classification like

* * * "All a Rhetorician's rules
Serves only but to name the tools"

of composition; and that the highest attainable dexterity in the classification of sentences may yet leave the learner without any skill in constructing sentences. In the common school, grammar and composition are to be considered as *means* and not as *ends;* that is, grammar and composition are to be taught so that the pupil may be able to express his thoughts, and not that the pupil may be able to parse every word of any given sentence. Therefore, in teaching syntax, our first care must be to teach the pupil the thought for which a sentence stands; by this means the pupil will be led to observe how other people express their thoughts, and this will prepare him for the study of composition proper. Of course, the technical terms above made use of, such as perception, conception, judgment, etc., are not to be used in instructing children.

The following is then our course of instruction. If we include under syntax the analysis of sentences, paragraphs and a whole composition, our instruction in syntax is:

1st. The pupil must state the event, scene, object, etc., which is the subject of any composition.

2d. The pupil must next determine the parts into which the subject is divided.

3d. The pupil must determine the thought expressed in each sentence. To do this, the pupil will naturally be required to name the subject or the object about which something is said, and the predicate, or that which is said of the subject. Next the pupil will learn the modifications of the subject and predicate. The pupil will encounter no difficulty in determining the nature of the predication, whether it is declarative or otherwise, whether it is affirmative or negative, etc.

4th. The pupil's attention may then be drawn to the leading principles observed in the construction of sentences, for instance the kind of article to be used before any particular noun, the repetition of the article in certain cases, in short the construction of sentences formulated into the so-called Rules of Syntax.

5th. The pupil's attention may then be drawn to qualities of style, to figures of speech, etc.

In short, the language of literature is to be made intelligible to the pupil; and as the pupil is introduced into literature principally through the Reader, instruction in syntax must be associated with, rest upon, the selections found in the reader.

In teaching composition, the pupil must first learn what is necessary to the complete expression of a thought, that is, what is necessary to form a sentence. Next he must be taught how in writing about any object, we must reproduce the train of thoughts, and how each capital thought is to be written in a sentence. The best manner of doing this belongs properly to the next division of our subject, of which we shall treat next month.

The grand object of all instruction in grammar and composition is to enable the pupil to learn the *meaning* and *use* of every word, phrase, clause or sentence which he sees used or may be called upon to use. Hence in etymology the *office* of a word is to be taught; in syntax, the thought expressed by a sentence is to be considered, and the constituent parts of a sentence are to be examined in regard to their office of expressing the thought. The technical nomenclature of grammar is to be introduced only when needed, and when the pupil is fully able to understand the meaning and use of such nomenclature. We have already indicated the extent of technical grammar to be introduced in teaching etymology. In syntax, the classification of the constituent parts of a sentence into subject, predicate, and object, on the one hand, and phrase, clause, member, etc., on the other, if introduced at all, must be introduced when the pupil undoubtedly understands the office of such constituent parts. The classification of sentences into simple, complex and compound, is, however, of very problematical soundness, and certainly not sound in logic. And as it is of no practical value, this classification may be left unnoticed. The classification of sentences into declarative, imperative, etc., will offer no difficulties.

THE public schools of Petaluma closed December 11, after a five month's term. Petaluma has an experienced and efficient corps of teachers, by whose labors the schools have been greatly improved during the past eighteen months. The next term will open three weeks from December 13.

STRIKING AT THE ROOT.

New York has for many years been probably the worst-governed city in the civilized world. This fact is attributable in the main to the exercise of an ignorant suffrage. The evils resulting from the political influence of ignorance, have now brought the city almost to the verge of bankruptcy. Taxation is crushing. Crime is rampant. Pauperism threatens revolution. Corruption is flaunting and shameless. And at such a juncture it is proposed to stamp out the little remaining vitality of the educational system, by a sweeping reduction of the salaries of public school teachers. The public school system, as it exists to-day, is notoriously inefficient, but it is the sole bulwark against the extension of that ignorance which has already produced such frightful results. The chief cause of its inefficiency in the past has been the narrowness of the policy which has regulated the pay of the teachers. The latter have been too frequently incompetent, for the reason that they were not paid to be competent. There is no sharper satire upon the system of education generally than exists in the contrast between the extravagance displayed in the erection of school buildings, and the parsimony shown in providing for the utilization of those edifices. In this respect we resemble the snob aristocratic, portrayed by Thackeray, who spent all his income in a gorgeous carriage and liveried servants, and starved his family to keep up the display. There is no public duty of half the importance and responsibility which belongs to teaching, but it appears to be generally assumed that teachers can live on the wages—or less than the wages—of a day laborer, and from time to time a fresh spasm of economy seizes our officials, and they cast about for an excuse to lower the standard of competence among teachers still further, by cutting down the already miserable pittances which they receive. We suppose there can be no question of the ability of the New York School Board to obtain all the teachers they want, at salaries seven per cent. less than the current rates; and if there were no distinction between the qualifications of teachers and the qualifications of waiters, hod-carriers and day laborers, perhaps it would be justifiable to seek the cheapest article in the market, though even in those occupations the cheapest are

not by any means necessarily the least expensive in the end. But here it is required to secure the rarest combination of qualifications, namely: first, the knowledge, and then the ability to impart it. As between the usefulness to society of a thoroughly trained, competent and enthusiastic teacher, and the usefulness of the physician, lawyer, clergyman, journalist or financier, there is absolutely no room for comparison, the former so completely overshadows the latter. And yet, while all the last named professions and occupations command large remuneration, it is still considered admissible, in an age reeking with cant about civilization and progress, to engage school teachers on the same principles as hod-carriers and sewing machine hands are engaged upon.

It is thought nothing out of the way to spend $50,000 on a school house, but when the building is finished it is agreed that the utmost economy must be practiced in utilizing it, and $50 a month is regarded as fair compensation for teachers who are expected to devote their whole time to the cause of education, and are at the same time expected to understand their business. Under so monstrously absurd a system it is impossible that the public schools should be what they ought to be. It is impossisible that public education should be other than the hollow sham it is; it is impossible that any fair proportion of the intelligence and culture of the nation should be engaged in the work. It is notorious that because of this foolish parsimony the schools have, to a great extent, become the resort of young, half-taught, inexperienced girls, who are content to eke out a living with the wretched salaries they receive, until a matrimonial opening occurs to relieve them from a task for which they were never fitted. A wise people would not tolerate this preposterous way of doing things. It would insist that better pay should be given for higher qualifications. It would import some of the more vital features of the admirable German educational system. It would refuse to turn the schools into experiment chambers for raw girls and boys. It would demand real teaching, and in order to obtain it would make the profession of educator dignified, remunerative and respectable, instead of continuing to treat it with the brutal stupidity and ignorant superciliousness with which the knightly bush-whackers of the Middle Ages used to regard all intellectual acquirements.

And what does the proposed action of the Now York School Board amount to? It is emphatically an announcement that ignorance and incompetence are wanted in the management of the public schools. It is a bid for poor material at low rates. It is in the nature of a declaration that no one need look to education as a field for intellectual enterprise; that good teachers are not wanted; that in fact education, in any true sense of the word, is not sought at all. This announcement is a disgrace to New York, but perhaps it is in accord with the eternal fitness of things, that from that ignornnce-ridden burgh should proceed so foul a blow at the very root of popular education. The politicians of New York, in fact, do not need the products of good teaching. It is in the control of the brutal herd of low brows and animal faces that their hopes all lie. Enlightenment is of necessity their deadliest foe, and even the poor semblance of knowledge which the public schools afford may be regarded by them with alarm and uneasiness. But if the intelligent section of the public understand what is needed for the conservation of republican institutions, they will fight this folly —this iniquity, rather—to the death. For it is not so much on account of the extent of the proposed reduction that the contemplated change is alarming, as because it is a recognition of the theory that this kind of mean and false economy is justifiable. And when the first reduction has been made, there will be nothing to prevent the repetition of the movement; for it will always be possible, by going lower and lower in the scale of intelligence and competency, to find cheaper and yet cheaper teachers. The scheme, in short, is a crime against society, and it ought not to be tolerated.—*Sacramento Record, Dec. 4th*, 1874.

ERRORS IN EDUCATION.

Nations have their idiosyncrasies just the same as individuals, and America's chief one is an implicit faith in the infallibility of her educational system. It would be difficult indeed for a foreigner to travel through any State in the Union without having his attention called to the existence of "our glorious institutions," and be repeatedly informed that our public schools rank high on the list. In fact, if there is one

thing more than another in which your genuine, patriotic American citizen believes his country outranks all others, it is in its system of education; and so fanatical is his belief in it as it at present exists, that no power on earth can persuade him that certain changes would be advantageous, and that this most beloved hobby in his stables has very many faults that might be easily corrected if he were not so prejudiced as to be blind to them.

We know that what we are about to say will call down upon our devoted heads the scorn and derision of every school teacher in the State, and we dread their wrath, for we know how scathing will be the sarcasm that will emanate from their anger. But, nevertheless, we fling ourselves recklessly into the breach, risking utter annihilation for the sake of the rising generation.

The primal, and naturally the greatest evil in our educational system is, that it is too systematic altogether. It works in grooves, like a complicated piece of mechanism, and our citizens seem prone to believe that the slightest alteration would throw the whole machine out of gear. Children, when they arrive at an age to be sent to school, differ very materially from each other in constitution, temperament, and ability to acquire knowledge. Suppose that half a dozen children enter a primary school simultaneously, and granting, for the sake of example merely, that all of their minds are perfectly fallow, they stand upon their journey towards the Pierian spring unfairly handicapped, for our common school system of education is an iron mould which the child is made to fit, instead of it being a matrix to receive the child, and though one or two out of the batch may easily adapt themselves to it, the others are at a decided disadvantage, as any peculiarities they may possess cannot be accommodated by the system. A bright and intelligent youngster may have his inherent abilities clogged by being taught in strict accordance with an established rule, which must not be deviated from one jot, and the consequence is that some far less intellectual lad, who learns everything parrot fashion, passes him in the race, and takes higher honors. Moreover, children's social stations materially differ, and this has a very considerable influence upon their ability to acquire and retain knowledge. Home associations leave an indelible

mark upon a child's mind; the infant whose parents are gross by nature and illiterate, even if he be the possessor of innate intellect, is generally easily distanced by a less brilliant competitor, reared amid refining influences. Children feel their social inequality just as acutely as those of older growth, and the poor man's son becomes careless and discontented because he knows that he is regarded with contempt by the luckier lad who cons the same lessons by his side.

The chief ambition of all school teachers seems to be to cram as much learning into a child in as short a space of time as possible, in order that they may acquire *kudos* as preceptors who can cause infantile prodigies to graduate at every commencement. These youngsters go out into the world filled with conceit, and imagining that they possess greater erudition than all their fellows, while the real fact of the matter is that they are simply sciolists, and generally intolerable little nuisances, who are always trying to air their superficial knowledge before older persons who are immeasurably their mental superiors. What *can* be the use of stuffing a pupil in a high school with logic, rhetoric, geometry, chemistry and astronomy, when he or she will probably have to commence the stern business of life as a clerk in a grocery or a trier-on of fashionable bonnets in a modiste's *maison des robes?* We hear our boys and girls defying all the rules laid down by Lindley Murray in the most reckless manner every hour of the day; and nine tenths of the communications sent by young men to this office, requesting that we will print reports of their base ball games, are so badly worded, written and spelled, that they would extort a cachinnation out of a gloomy misanthrope. Yet these lads would look with derision and contempt upon a grammar and spelling-book, for are they not deep in the mysteries of metaphysics and quadratics? In almost all of our public schools arithmetic is made the foundation and test of all progress, and everything else is sacrificed to it, though little more than a thorough knowledge of the elementary rules of that science is needed in the ordinary affairs of after-life. A child that has a good memory consequently always stands well in class, and is advanced rapidly, though he may forget in a very brief space of time all that he has repeated by rote to his teacher. The child that has no taste for arithmetic remains at the foot of his class,

though he may be a brilliant genius in all else, while his scholarship continues. It is a notable fact that very many of the most celebrated men of the present day, and a host of those of a by-gone era, never could do a sum in multiplication or division, even if their lives depended upon such a performance. A plain, sound general education is what our sons and daughters should receive in our public schools, such an education as will fit them for business pursuits. The colleges can afford to instruct young men and women in the higher branches of learning, for the lucky lads who become collegians generally have parents with plethoric pocket-books, and are destined for different walks in life to their less fortunate cotemporaries, who step from the school house to the store or the plow. The plan of giving a free education to every child in the United States, is a grand one, and deserving of the highest commendation; but there is too much routine work done, and the teachers are mere automatic machines, who hear lessons *viva voce*, and cannot stop the whole class for the purpose of instructing some child who cannot learn to repeat anything without understanding it. Fewer branches of study, more instruction, and less of that trashy stuff yclept recitation, would be an admirable basis upon which to build up the reform so much needed in our educational systems.—*Miners' Journal.*

EVENING SCHOOLS have been opened in San Jose and Oakland.

ALAMEDA is building a $12,000 High School.

MARYSVILLE is setting out eucalyptus trees around the public schools.

THE Vallejo School Department cost $11,500 during the past five months.

TWO KINDERGARTENS are in successful operation in San Francisco. A Kindergarten should be established in every town and village of this State.

TEXT BOOKS.—The Sacramento *Record* learns from trustworthy sources that efforts are being made by interested parties to persuade the State Board of Education to make some extensive changes in the text-books used in the public schools. We join the *Record* in protesting against any such change. It is unnecessary to keep continually changing books, and gross injustice to the taxpayers. In nineteen cases out of twenty there is a job in these changes. The fewer we have of them the better.—*Vallejo Independent.*

CHEAP EDUCATION.—It is the very sensible, business-like opinion of the Binghamton *Republican* that "cheap wages must result in cheap teachers, and cheap teachers will naturally cultivate cheap minds, which will fit the pupil for living a cheap life; that is, not attaining to any occupation above a mediocre. Let the subject of cheap teachers be thoroughly discussed before we have any reductions, and it will be found at once that the great majority of the educated minds of the country are not in favor of cheap educators."

DEPARTMENT OF PUBLIC INSTRUCTION.

ABSTRACT OF STATISTICS

From State Superintendent's Report, for School Year ending June 30, 1874.

	1873.	1874.	Increase.
White boys between 5 and 17 years old.	See Remarks.	79,695	
White girls between 5 and 17 years old.		77,604	
Total whites between 5 and 17 years old		157,299	
Negro boys between 5 and 17 years old.		580	
Negro girls between 5 and 17 years old.		485	
Total Negroes between 5 and 17 years old		1,065	
Indian boys between 5 and 17 years old.		652	
Indian girls between 5 and 17 years old.		411	
Total Indians between 5 and 17 years old, living under guardianship of whites		1,063	
Total census children between 5 and 17 years old		159,427	
Total whites under 5 years of age	69,222	74,328	5,106
Total negroes under 5 years of age	254	348	94
Total Indians under 5 years of age	247	206	Decrease 41
Total children under 5 years of age	69,723	74,882	5,159
Total whites between 5 and 17 at public school	See Remarks.	105,064	
Total negroes between 5 and 17 at public school		615	
Total Indians between 5 and 17 at public school		171	
Total attended public schools between 5 and 17		105,850	
Number whites between 5 and 17 attending private school		14,045	
Number negroes between 5 and 17 attending private school		79	
Number Indians between 5 and 17 attending private school		19	
Total number attending private school between 5 and 17		14,143	

	1873.	1874.	Increase.
Number whites between 5 and 17 who attended no school	See Remarks.	38,286	
Number negroes between 5 and 17 who attended no school		338	
Number Indians between 5 and 17 who attended no school		810	
Total children between 5 and 17 who attended no school		39,434	
Total number enrolled	107,593	117,870	10,277
Average number belonging	78,395	78,174	Dec. 221
Average daily attendance	69,461	70,790	1,329
Percentage of attendance on average number belonging	88	90	2
Total number of schools	1,868	1,989	121
Total number of male teachers	882	943	61
Total number of female teachers	1,454	1,528	74
Total number of teachers	2,336	2,471	135
Cash received from State apportionment	$ 430,219 60	$ 428,418 12	D $1,801 48
Cash received from county taxes	1,179,072 45	1,285,529 12	$ 106,456 67
Cash received from miscellaneous sources	673,027 35	338,657 95	D334,369 40
Total cash receipts	$2,551,779 07	$2,478,044 13	D$73,734 94
Amount paid for teachers' salaries	$1,434,366 93	$1,534,656 93	$ 100,290 00
Amount paid for sites, buildings and school furniture	374,069 44	189,843 69	D184 225 75
Amount paid for school libraries	24,879 48	20,975 79	D 3,903 69
Amount paid for school apparatus	4,365 70	4,142 30	D 223 40
Amount paid for rent, repairs, fuel and contingent expenses	275,674 71	328,753 45	53,078 74
Total expenditures	$2,113,356 25	$2,078,372 16	D$34,984 09
Total valuation of school property	4,057,415 45	4,445,140 91	387,725 46

Remarks.

CENSUS STATISTICS.—The last Legislature changed the age of census children. For 1873 the census marshals listed the children between 5 and 15 years of age; this year, the children between 5 and 17 years of age. A direct comparison of census statistics is, therefore, not possible. The increase in census children is 17,817, which includes the increase of children between 5 and 15 years of age, and the number of children between 15 and 17 years of age. So 17,817 represents a double increase.

ATTENDANCE AT SCHOOL.—1. *At Public Schools.* Last year the whole number of children enrolled in public schools, amounted to 107,593. Of these, 97,681 we computed to be census children, that is, children between 5 and 15 years of age, so that we had last year enrolled in our public schools nearly 10,000 children more than 15 years of age. This year we have 117,870 children enrolled in public schools, an increase of 20,189. The *double* increase in census children is

only 17,817, so that we have a net gain of nearly 3,000 in the attendance at public schools. Or to look at this increase from another point: the increase of attendance at public schools was a little over 13 per cent. more for 1873 than for 1872; the increase of attendance is nearly 19 per cent. more for 1874 than for 1873. And yet these figures show no real advance in attendance at school. For among 117,870 are included all children enrolled at any time in public schools, if even only for a day. The number of children to be considered as regular attendants, is only 78,174 for 1874, which is 221 less than the regular attendance for 1873. It may be that the decrease is not real, but only apparent, and owing to errors made by the new County Superintendents elected last year, and who are new to the business, especially of making reports. And yet when we remember that for 1873, when the County Superintendents were not new to this business, and in which year we took extra pains of having errors corrected, the regular attendance was 331 less than for 1872, we are inclined to think that perhaps the reports *are* correct, and that 1874 shows but the usual increase in irregular attendance or truancy. In 1866, 25 per cent. of the children enrolled in public schools were so irregular in attendance that these children could not be considered as attending school at all; in 1873, the percentage of such children had increased to over 27 per cent.; and in 1874 we have very nearly 34 per cent. We note, however, an increase in the average daily attendance of those who are regular attendants at school.

2. *At Private Schools.*—In 1873, the census marshals reported 8.84 per cent. of the census children as attending private schools; in 1874, they report 8.87 per cent. in attendance. This slight increase is accounted for by the fact that in 1873 only the children between 5 and 15 years of age were listed; in 1874, in addition to these, the children between 15 and 17 years of age. For 1874, we have an account, therefore, of those children who attend public school till 15 or 16 years of age, and then enter some private institution of learning.

3. *At no School.*—39,434 census children, or 24.73 per cent., are reported as attending no school. This is an increase of over two per cent. over last year's non-attendance. But if we remember that for 1874, the increase in census children is over 11 per cent., it will be seen that there is a material decrease in the non-attendance at school. This corresponds with an observation we made *supra*, in speaking of the attendance at public schools.

FINANCIAL STATISTICS.—The receipts for the year are $73,734 94 less than those of 1873; we hope to see a better showing for 1875. In expenditures, there is an increase in the amount paid for teacher's salaries, and in the amount paid for rent, fuel, etc.; but such a heavy decrease in the amount paid for sites, building and school furniture, that the total expenditures for 1874 are $34,984 09 less than the total expenditures for 1873.

In conclusion we desire to state that the above statistics are compiled from the County Superintendents' Reports as received. It is very probable that on a thorough examination of these Reports we shall, as usual, discover enough errors to alter the above statistics in many particulars. The census statistics alone have been examined and corrected, and will remain as given.

EDUCATIONAL ITEMS.

CALIFORNIA.

IF the discipline of the public schools of Chicago can be maintained at a high standard of efficiency without the use of the rod, we should suppose that similar results could be reached in the public schools elsewhere, and especially in San Francisco. According to a recent report of the Chicago Board of Education, there is better discipline in the public schools of that city without corporal punishment than was formerly maintained with it. The tabulated statement of suspensions for ten years is as follows:

1865–66, one suspension for..... 20,000
1866–67, one suspension for..... 12,000
1867–68, one suspension for..... 12,000
1868–69, one suspension for..... 12,000
1869–70, one suspension for..... 10,000
1870–71, one suspension for..... 14,000
1871–72, one suspension for..... 22,000
1872–73, one suspension for..... 9,000
1873–74, one suspension for..... 24,000

It is to be noted that in the year '73–4, the year in which corporal punishment had been abolished, the suspensions were less than in any previous year. In nine schools, having upward of six thousand pupils, there was not a single suspension. Now if better results can be obtained without flogging than with it, certainly the last reason for corporal punishment has disappeared.

FROM the *Annual Report of the U. S. Commissioner of Education*, for 1873, we copy the following regarding the educational condition of the States on the Pacific Slope:

Nevada still struggles with the difficulties incident to a vast surface and a small and scattered population busy with mining, which tempts many from the schools; she returns 5,675 children of school age, and in her 76 schools 3,478. Her State University is to be at Elko, provided the citizens there secure it 20 acres, and a building to cost not less than $10,000, furnished for the accommodation of 100 pupils.

Educational activity in Oregon has been very greatly stimulated during this the first year of the service of the State Superintendent. The establishment of graded school systems in the towns has not advanced as rapidly as could be desired; and, although superior instruction is receiving increased attention, the number of young persons prepared to take a full collegiate and professional course of instruction is not so great as might be reasonably expected. This, it is hoped, the general improvement of the educational system and sentiment will speedily remedy. The schools of the city of Portland, and of the county of which it is the seat, still hold their position at the head of the system in the State. Five colleges, inclusive of the State Agricultural College, report 763 preparatory students and 298 collegiate. The building for the State University at Eugene, is in course of construction.

California, new as she still is, justifies the general sense of her importance by reporting a school population of 141,610, and a school enrollment of 107,593, her school revenue reaching $2,551,799, or about $23 70 for each enrolled child. Clear evidence of popular favor towards her public schools comes in the fact that within eight years 15,294 children have been transferred from private schools to them. And yet ample room remains for great private schools, one reporting 400 pupils, another 300, a third 258, while upwards of 6,000 attend about 80 pay schools in San Francisco. Twelve denominational colleges show an aggregate of 838 preparatory students and 545 collegiate, while the State University at Berkeley, near Oakland, gives promise of affording high advantages for superior instruction.

THE TRAINING SHIP.—The plan prepared by Lieutenant Commander Henry Glass for organizing the training ship "Jamestown" was presented to the Board

of Supervisors last night and passed to print as an ordinance. The officers will consist of two lieutenants, a surgeon, an assistant paymaster, and two junior officers of the grade of master, to act as assistant instructors, will be taken from the Navy. Instructors in the course of English studies will be taken from the common schools of the city. The city will have to employ such seamen and petty officers as will be necessary to keep the ship in perfect order. Seven officers and twenty seamen will be necessary, and their pay and the expenses of the ship are estimated at $1,288,000.

Candidates for admission must be between thirteen and seventeen years of age, and will be admitted only on the written application of parents or guardians. An entrance fee of about $25 or $30 will be required for the purpose of furnishing the candidate with uniform, hammock, bedding and text-books. A monthly charge of not less than $10 will be made to defray the expenses of clothing and food. The candidates are required to sign for not less than three years. In case they are sent to other vessels or go to sea, they will receive compensation. On entering, the candidates, in addition to their studies and drills, will be required to assist in the performance of such ordinary duties of the ship as are necessary to keep her, her rigging, sails and boats, in good order. In case the poverty of the parents should render the payment of the entrance fee and the monthly charge suggested impossible, the Board of Supervisors may order the reception on board the training ship of boys deserving such action, and allow such fee and expenses to remain a charge against the account of the boys, to be repaid as far as possible out of the advance wages paid them on going to sea.

The Commander can order a court martial for offenses deserving a more serious punishment than he is authorized to inflict. Flogging is in no case to be permitted. The punishment will consist of the following: first, reduction of any rating established by himself; second, confinement with or without irons, single or double, such confinement not to exceed ten days, except in case of an offender to be brought before a court martial; third, solitary confinement on bread and water not exceeding five days; fifth, deprivation of liberty on shore; sixth, extra duties. All punishments inflicted by the Commander or by his order shall be entered upon the ship's log.

Mild punishments, such as extra police duties, drills or duties aloft, deprivation of liberty ashore, confinement in irons for a few hours at a time, are to be preferred for boys. In cases of misconduct among the boys deserving more serious punishment than the commanding officer is authorized to inflict, he is empowered to return the offender to his parents, and recommend his discharge from the school by the Board of Supervisors.

A "report book" shall be kept by the executive officer, in which shall be noted all offenses and punishments. This book shall be examined and approved daily by the commanding officer.

Spirituous liquors will not be allowed on the ship except for medicinal purposes.

The course of instruction will embrace all branches of practical seamanship. Instruction in gunnery will include handling and working great guns, cutlass exercise, and drills with pistol and musket. Elementary instruction will be given in working a steam engine and in the duties of firemen. As thorough instruction will be given as the proficiency of boys in mathematics will admit. This should include finding a ship's position on a chart, plotting courses and ordinary "day's work."

Instruction in the English branches will be of the usual character. The introduction of mechanical labor on board of the "training ship" is deferred for the present, to enable those having charge of the school to first put into practical operation the system of instruction in seamanship and other designated branches.

The examinations will be semi-annual, and any boys found who have made satisfactory progress in their studies may be sent to merchant vessels or men-of-war to finish their service. It is recommended that the Representative in Congress from this district be urged by the Committee to offer the appointment as Midshipman at Annapolis, which is given every two years, as a prize to be competed for by boys of suitable age.

Whenever boys are found qualified, on examination or after a cruise, to do the duties required on board the "training ship," they will be given employment and

pay in preference to others. In this way nearly all the work and instruction of the "training ship" may be gradually done by graduates from the school. The boys who are found qualified at the examinations for duty in sea-going vessels will be furnished certificates on parchment, showing in what branches they have passed, and their proficiency in each one. These certificates will be of service to them in obtaining ready employment from masters of vessels.—*S. F. Post.*

OTHER STATES.

PENNSYLVANIA has 31 colleges.

CHICAGO employs 93 per cent. of female teachers.

THE total number of students at Dartmouth this year is 457.

A FREE Evening Art School is to be established in Columbus, Ohio.

THE Kindergarten system in the St. Louis schools has been so successful that Superintendent Harris recommends the establishment of at least two additional schools.

PHILADELPHIA is to have immediately a handsome new Normal School building for girls. The style of architecture is the modern collegiate, without any attempt at useless ornament.

EDUCATION in Delaware is in a deplorable condition. The absence of any supervision renders it impossible to give any authorized report concerning it. In 1870 there were in the State 23,100 persons over ten years of age who could not write.

IT is the opinion of Professor E. E. White, ex-Superintendent of the Ohio schools, that no man is fit for the position of teacher "unless his knowledge of what he teaches is so fresh and thorough that he would be able to teach if all the text-books in the world were burned up."

[*From the annual report of the U. S. Commissioner of Education.*]

SUMMARY OF EDUCATIONAL CONDITION IN THE SOUTHERN STATES FOR 1873.—In Alabama, the Board of Education has labored under great embarrassment, from the difficulty of securing from an impoverished people the needful funds for the support of free schools. As a consequence of this, teachers have in many instances had to wait months for the payment of salaries due them, and a large number of the free schools in country districts have been closed. In the large towns, aid from the Peabody Fund and the American Missionary Association has kept schools still in successful operation. The lack of funds has of course affected the high schools under the State system, but a promising State Normal School has been established, the University and State Agricultural College have continued operations, and the condition of the Institution for the Deaf, the Dumb and the Blind appears to have improved.

Arkansas has labored under similar embarrassment with respect to funds. The State certificates, with which taxes and teachers have been too generally paid, having fallen to less than half their face value, school sessions have had to be cut down to three months, and teachers, unable to secure even half their salaries, have very often abandoned the profession or left the State. Fifteen towns have, however, organized town school systems, under a special Act, and in these the schools "are believed to be doing reasonably well." Interest in the public school system seems to increase amongst the people, the new Industrial University is so well advanced as to give promise of improvement in superior education, and measures are on foot to give greater advantages for education to the colored people.

Louisiana has struggled through the year under kindred financial troubles with the two neighboring States just named, and as, by an unfortunate change in the school law of Texas, the public school system in that State has been almost broken up, the outlook for education in the Southwest is not enouuraging, except in Mississippi, where opposition to the free school system seems to have

greatly diminished, where popular interest in it has obviously much increased, where facilities for normal and secondary education are enlarging, and where, in the State University and State School for the Deaf and Dumb, superior and special training show signs of advancing thoroughness.

The new State Superintendent of Instruction in Florida reports an increase of 56 schools in 1873, making, with 113 added in 1872, an addition of 169 to the 331 previously existent. The increase of attendance in two years has been 4,000, while reports from leading schools indicate an advance in methods of instruction as well as in results. A site for the State Agricultural College has at last been agreed upon in Alachua county (including 20,000 acres), and $50,000 cash secured by that location; a fair course of collegiate study has been mapped out by the Trustees, and steps towards the organization of a corps of instructors taken. The laying of foundations for a University for colored students is another mark of progress here.

Georgia, after a cessation of public school teaching for a year (except in certain towns), has again set her schools in operation, and an earnest Superintendent is doing obviously his best to make the new effort a success. In the larger towns, school systems, including all grades, have been established, with Normal classes every Saturday for the whole body of teachers in each town; 109 academies and high schools report generally fair courses for secondary education; and an effort is on foot to unify throughout the State the whole system of superior instruction by a compact between the University and the colleges.

South Carolina, in spite of great discouragements, shows an increase of 98 free schools and 147 new school houses over 1872, with an additional school attendance of 7,431, and an additional expenditure of $113,981 37 for public schools, while her University has been made practically free to all by the remission of professorial fees and room rent.

North Carolina, though embarrassed by a poor school law and by restrictions on local taxation for school purposes, has increased by about 74 per cent. her receipts for free schools, and by about 190 per cent. the attendance of them.

Kentucky, hampered by financial trials, has friends of education who have pressed forward, under an energetic Superintendent, amending her school law, advancing the qualifications of her teachers, improving her school houses, and taking steps towards a general education of her colored population. "With rare exceptions," says the State report, "the reports from different counties present evidences of an educational revival pervading almost every section of the State."

In Virginia, though there has been a slight falling off in receipts and expenditures for school purposes, as well as in enrollment and average attendance, there are 501 new schools, while a great number of school houses built during the year and a large increase in the value of school property combine with the declarations of both political parties in the last canvass to show that the purpose of the people is to build up the public school system solidly and permanently. Institutions for secondary instruction are numerous throughout the State; provision for scientific training has been made in the new agricultural colleges and the State Military Institute; and, through the fostering influence of two Universities and six colleges, superior education is so well advanced, that, in proportion to population, Virginia compares favorably with any of the States as respects the number of students in college.

The returns from Tennessee are imperfect, but enough appears to indicate that the organization of the State system has gone steadily forward under the direction of the Superintendent, receiving deservedly the support of the State Teachers' Association and friends of education generally, and the almost unanimous aid of the newspaper press. All the embarrassments appear to be yielding; in some counties, to be sure, slowly and reluctantly. That greatest difficulty, lack of means, and the consequent depreciation of teachers' orders for pay, appear to be approaching a termination. The effect of the Peabody aid has been particularly conspicuous. The Vanderbilt University, at Nashville, and the Methodist Episcopal University, at Knoxville, intended to be institutions representing respectively the great religious interests of the two branches of the Methodist Church in the South, have been established during the year.

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THE

CALIFORNIA TEACHER.

FEBRUARY, 1875.

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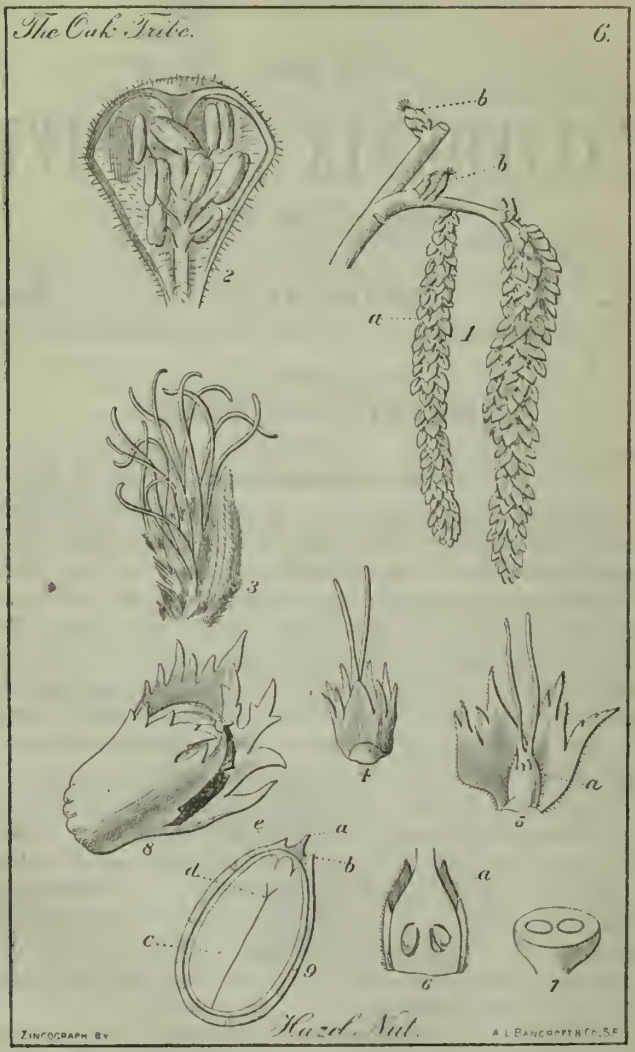
[*For the California Teacher.*]

BOTANY FOR SCHOOLS.

VI. THE OAK TRIBE.

The Hazel, when young, is one of the most accessible plants to you, and affords a good illustration of the structure of the apetalous division of dicotyledonous plants. At the earliest period of Spring you must have remarked the branches of the Hazel loaded with little yellow tails, which swing about as the wind disturbs them, and fill the air with a fine powder, the particles of which may be seen glittering in the sunbeams like motes of gold. These tails are called *Catkins* (fig. 1, *a*), and are composed of a great number of little scales, which are arranged, one behind the other with the utmost regularity, as you may easily discover by inspecting them before they separate. Each scale has on its inner face about eight anthers, that seem to rise out of a two-lobed flat body, which adheres to the scale (fig. 2); no other structure is to be found; apparently neither calyx, nor corolla, nor pistil; nothing but the two-lobed body sticking to the scale and bearing stamens. Botanists consider the scales braets, and the two-lobed body a calyx in an imperfect state.

This then is an instance of a simpler kind of organization than any you have before met with in a flower. It is, however, not quite characteristic of the Oak tribe, for the Hornbeam


The Oak Tribe.
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Hazel Nut.
ZINCOGRAPH BY
A L BANCROFT & Co. S.F.

has no calyx whatever, while the Oak, and the Beech, and the Sweet Chestnut, have a much more perfect one than the Hazel.

If the Hazel had none but stamen-bearing flowers, you would never have any nuts in the Autumn, for there is nothing in those flowers which could, by any possibility change into a nut. In this plant not only are the the stamens and pistils in different flowers, but in different parts of the plant, and organized on quite a different plan. If you observe attentively those buds of the Hazel which grow near the *Catkins* (fig. 1, *b*, *b*), about the time when the stamens are shedding their pollen, you will perceive some little red threads protruding beyond the points of the buds, and spreading away from the center; those are the stigmas, and the pistils are enclosed within their scales, where they are safely protected from accident and cold. At the earliest moment when the stigmas can be discovered, let the scales be removed (fig. 3), and you will find the flowers clustered together among a quantity of soft hair, which seems provided as an additional means of shielding them from the weather, and to serve the same purpose as the warm lining of down which the birds provide for their young when they first break the shell, and before they are fledged. Each of these flowers is surrounded by a jagged sort of cup (figs. 4 and 5), which is originally much shorter than they are here, but which in time grows considerably longer; that cup is the involucre. The flower itself consists of a jagged superior calyx (fig. 5, *a*); an ovary with two cells and two seeds (fig. 6), and two long thread-shaped crimson stigmas. Thus you see the calyx of the pistil-bearing flower is much more perfect than that of the other kind of flower, but it is still very imperfect.

The pistils and the stamens being thus separated, there would be no chance of the pollen of the one falling on the stigma of the other and fertilizing it, unless an unusual quantity of stamens were provided; hence it is that on a fine day in Spring the whole air is, as I have just said, so impregnated with particles of pollen that they cover everything as with a fine dust.

By degrees, as warm weather advances, the protection of the scales of the bud ceases to be necessary to the young flowers, which swell and burst through them; the involucre daily grows larger; the stigmas having fulfilled their destiny, shrivel up; the ovary enlarges; one of its ovules grows much faster than

the other, and gradually presses upon it till it smothers it; the shell hardens; an embryo makes its appearance, and by degrees fills up the cavity; and at last you have a perfect nut, with its husk (fig. 8) or involucre. At the point of the nut is to be seen the remains of the calyx (fig. 9, *b*); but no trace can be found of the cell and ovule which were smothered, so that a one-celled fruit is produced from a two-celled ovary. You will now know why nuts sometimes grow in clusters and sometimes singly. If cold or accident should destroy any part of the cluster of pistils in the bud, but a very few nuts, perhaps only one, will grow and ripen; but if they are mostly saved you will then have the large clusters which are so common in seasons which have been preceded by mild springs. The nut itself affords an excellent illustration of the structure of a dicotyledonous embryo; the two great fleshy lobes into which the nut separates when freed from its skin (fig. 9, *c*), are the cotyledons; the little conical part at one end (*e*) is the radicle, and the small scale-like body which lies between them in the inside (*d*) is the plumule, or young stem.

Still more curious than those of the Hazel are the changes that occur during the growth of the fruit of other genera of the Oak tribe. In the Oak itself the involucre is formed of a great many rows of scales, which gradually grow larger and harder, and more numerous, and at last become what you call the cup of the acorn, a part you never would have guessed could have been made out of a number of little leaves, if you had not watched their successive changes. The ovary at first contains three cells, and each cell two young seeds; but in obedience to the constant command of nature, one of the seeds grows faster than the rest, presses upon the other cells and seeds, gradually crushes them, till at last, when the acorn is ripe, all trace of them has disappeared.

The following are the most important of our California catkin-bearing trees and shrubs:

Beaked Hazel-nut (*Corylus rostrata*). A common shrub, usually found on protected hillsides throughout the State.

California Chinquapin (*Castanea chrysophylla*). A mere shrub in the southern and central portion of the State. In Mendocino and Humboldt counties it grows, however, to a tall

forest tree, from 50 to 150 feet high, and several feet in diameter.

White, or Weeping Oak (*Quercus lobata*). This species of deciduous oak is the most characteristic tree of our inland valleys. Its acorns ripen annually, and are usually quite large.

Black Oak (*Quercus Sonomensis*). A medium sized deciduous species of oak, usually found growing on sheltered hillsides, especially on the Coast Ranges. Its acorns are biennial.

Live Oak (*Quercus agrifolia*). A large evergreen species of oak, ranging from Cloverdale south to the Chuyamaca Mountain, in San Diego County. Its acorns are annual.

Mountain Live Oak (*Quercus chrysolepis*). A tall evergreen species, usually with gracefully weeping branches. It is generally found growing on knolls, or on the slopes of deep canons or ravines. Its young leaves are golden yellow on the lower surface. Its acorns are annual.

Live Oak (*Quercus Wislizeni*). A medium sized evergreen species of oak, resembling, at least some forms of it, very much, *Quercus agrifolia*, the live oak so common around the bay of San Francisco. Its acorns, however, are biennial. It extends from Cloverdale northward into Mendocino and Humboldt counties, and along the foothills of the Sierras.

Chestnut Oak (*Quercus densiflora*). A middle sized evergreen species of oak, which is quite common in the Redwoods, but rarely met with on the Sierras. Its bark yields an excellent material for tanning. The acorns are biennial.

The numerous shrubby species growing in this State are omitted.

"HAD I the choice of only four things to be taught to my children," said a wise mother in our hearing, "they should be able to read well, to write well, to sketch well." True, thought we, perfection in all these will earn their possessor a maintenance in any country, enable him to entertain any human being in whose company he may be thrown, or to amuse himself, when alone, whether in mountain solitudes or desert wilds, or cast away on an uninhabited island in the midst of the sea.

[*From the Illinois Schoolmaster.*]

THAT GEOGRAPHY CLASS.

"What is to be done?" and Superintendent Everest's usually happy face wore a doleful expression. He and Miss Ward, principal of the High School, were looking over examination papers; those on geography had called out his despairing question. A class of a score or more had been examined for admission to the High School. They had acquitted themselves well in everything except geography, but in *that*—shade of Malte Brun! The Mississippi meandered sweetly along from Georgia to Michigan; the Amazon drained the Alps; Maine was warmer than Oregon on account of the Gulf Stream; London and Paris were south of New York.

"Do? we can't do anything with them here; send them back till they learn something of geography," Miss Ward responded. "It will not do any good to send them back," said Mr. Everest. "The poor scholars are not so much to blame for it after all."

He and Miss Ward had grown up together; for years she had been his "right-hand man" in school, so he spoke to her freely on all school matters, feeling sure that what he said would go no farther.

"Miss Englewood is a first-rate teacher in everything except geography, but she *can not* teach that; her scholars all seem to hate the study."

"Hum-m-m," musingly, while she tapped the pile of manuscript with her pencil for a time; then, looking up with one of her quick, sudden movements, Miss Ward asked, "Do you think I could teach geography?"

"You? yes, if you tried; I never yet saw you try anything in which you did not succeed; but what notion have you in your head now?" She had a fashion of springing plans upon him with uncomfortable suddenness, and in spite of their years of intimacy, he never knew just what to expect when Miss Ward put on her thinking-cap. "I have a mind to admit them to good and regular standing, except in geography; and, in that, form them into a class and see how much I can teach them. I never had much experience in teaching geography, but I do believe I can get *something* into their heads."

"But you ought not to do it; you are over-worked now; it

will give you an extra class, and a troublesome class, I fear. They seem to hate geography; they thought they were through with it a year ago; those great boys, bigger than you are, will certainly rebel if they are put back into it," said Mr. Everest. "I presume they will, but then I like a good, breezy rebellion once in awhile; it clears the atmosphere," responded the plucky little lady. "I have some theories on the subject I want to test; I never had a chance before. So, by your leave, Sir. Superintendent"—bowing obsequiously—"I'll try them on the class."

"Experimenting as usual," laughed Mr. Everest. "But what if your patients die under the operation? Seriously, though, if you have the time and strength, I do wish you would take that class in hand; I confess I am at my wit's ends. But I am really afraid they will give you trouble; those big boys are just at the age to feel *big*, and think they know everything."

Mr. Everest was just going out as he said this, but stuck his head back to add, "Of course, if they do give you trouble I'll help you out of it."

"Thank you," she responded with one of her bright looks, "but I prefer to manage my domestic affairs in my own way."

"You are perfectly welcome," he answered, and left her to her meditations.

These meditations were the most important part of Miss Ward's teaching. They occurred in all sorts of out-of-the-way places, but their favorite field was the old lounge in her study at home. There, cuddled up like a kitten, with her head so deeply buried in the pillows any one else would have smothered, she thought out those plans which so often astonished her pupils, but which usually proved successful. She probably could not have told you whether or not they were "evolved from her inner consciousness," for she was not metaphysically inclined; they were evolved from *somewhere* and that was enough for her purpose.

Thunder-clouds are nothing in comparison with the black looks which greeted Miss Ward as she announced her programme next morning; but there she stood, sweet and smiling as a May morning, utterly oblivious to the mutterings of the storm around, or the lightning flashing from the black eyes of the "big boys," till those mutterings culminated in an audible

"If I've got to be put back into geography, I'll leave school," from Walter, the acknowledged leader of the set; "So'll I," and "I," came from his followers, while the girls, not quite daring to speak out, pouted a surly defiance.

Then Miss Ward did that very bad thing, theoretically; she proposed a compromise. "I'll tell you, boys, what we will do; you come into the geography class for one week; if you do not like it then, at the end of the week I will excuse you from it." Her tones were low and sweet, as though she were talking to her dearest friend in her own parlor. There was always something persuasive in her voice, and the scholars began to come under its influence; the blackness faded out a shade on the boys' faces, and the pout was less perceptible. She followed up her advantage, and in a few moments all had consented to the compromise.

Miss Ward had a knack of doing as she pleased, and making everybody feel that she had done just right. Her most unheard-of projects, received at first with a gasp of astonishment —not to say horror—in the course of a week seemed the most common-place things possible; the only wonder was how the world had existed so long without them.

"The geography class will meet me at two o'clock, in the recitation-room," Miss Ward said. Put on as brave a front as she might, inwardly she was full of fear and trembling, so she asked her assistant to exchange rooms with her for that hour. If she failed she did not wish the whole school to witness her failure. At two o'clock the class were all in their places, looking wonderingly at a large square drawn on the black-board, with N. at the top, S. at the bottom and E. and W. at either side. Miss Ward drew a line through its centre, from east to west, saying, "This is Main street," and another from north to south—"This is Broad street, and the whole square represents?" —"Westering," they said, as she paused, the truth dawning on them that she was drawing a map. Now, map-drawing had always been a stone of stumbling, and Miss Ward knew it. "How long are each of these sides?" she asked, chalk in hand. "Three miles," answered Joe, whose father was city surveyor, and she marked the two adjacent sides with the figures. Placing her chalk in the centre, "What shall I put here?" "The Public Square," all answered, and she drew an octagon,

for the "Square" of Westering has eight sides. Drawing a line about an inch to the west of Broad Street, she asked, "What street is this?" "Cedar;" "And this?" "Locust;" thus the dozen streets nearest the Square were represented. Then the High School was located, the college, the depot, the foundry, the Opera House, the corn-planter manufactory, and other prominent buildings. Had the scholars been younger, Miss Ward would have let them do this locating; as it was, she judged it safer to do the work herself till sufficient enthusiasm was aroused to "tide them safely over" the objecting point.

When the public buildings had been located she remarked: "It would be pleasant to have each of our homes marked on our map; there is mine"—placing a dot—"and there is Mary's and Charlie's, but I do not know where you all live; Walter, show us where your home is." The boy came promptly to the board, made the required dot, and was followed by the others till each home was designated.

The warning bell sounded. All were astonished at the shortness of the hour. Miss Ward took the eraser to rub out the map. "Don't! don't!" exclaimed several, "We want to keep it."

"Well, I will not, but you know we cannot keep it long on the board. The arithmetic class to-morrow morning will erase it. Does not each of you wish to draw for himself next hour? Here is paper." All left the recitation room delighted with the plan, and for the next hour worked like beavers.

When the class came together next day, each found himself possessed of a veritable map of his own drawing. "Who'd have thought map-drawing was so easy," said Sam, who had been a most inveterate grumbler on this subject. To-day the hour was mostly spent in comparing, correcting, filling out the maps. Wherever possible, Miss Ward commended warmly; where correction was required, it was made most kindly and helpfully.

"We want our maps as accurate and full as possible," she said. "You will probably find something to add to them each day; so by the time we are through you will each have a very useful map of our own city. We wish to know not only where the buildings are," she continued, "but what is done in them; we will try to find that out for our lesson to-morrow. If we

attempt too much, we do not do anything well; so we will take only two or three topics each day. For to-morrow we will take the schools, the dry goods stores and the foundry. Now each fix your mind on one of these topics—no more—and to-morrow be prepared to give us some facts about it. Of course, several will choose the same topic, so we shall be sure of learning a good deal about each. In our teachers' associations we appoint some especial one to 'open the discussion;' it may be well for us to do so: Walter, you may tell us about the public schools"—the boy looked as if he already knew all about those. But as she continued, "How many buildings are there in town, how many teachers, how many scholars enrolled, the average attendance?" etc., he looked down and did not feel so wise. "If you have any difficulty in learning these particulars, apply to Mr. Everest, he can assist you. George may report in the same way about the college." His father was a professor in it. "Kate may tell us about the stores; ladies are presumed to be interested in dry goods; tell us how many stores there are in town, what each sells, and, if possible, some statistics showing the amount of business done by them. Your father can tell you about his own store, and probably can help you in learning about others." To Sam, whose father was one of the foundry firm, she gave that topic, asking him to report how many men were employed, how much capital invested, how much iron used annually, how many engines and other things made; in short, all statistics which give an idea of the business.

The next day brought such a set of eager faces into the class-room that Miss Ward saw that each had something to tell. She wisely concluded to let those who had little to say speak first, lest they should be disheartened by the abundance of those who had much. "We will reverse the order of our teachers' meetings," she said, "and let those especially appointed speak last instead of first, keeping the best wine till the last," she added, as she saw Sam's face darken. Every scholar had something to tell. Miss Ward was astonished at the amount of information elicited, and did not hesitate to say, whenever occasion required, "I am so glad you told us that, for I never knew it before."

A week was spent thus studying their own city, its institutions, industries and history. What a ransacking of the town

they made in their search for facts and statistics! If Miss Ward had not guarded against such a result, that class would have been voted a nuisance by every business man in town. But she took care that only one scholar should go to one individual or firm for information, and impressed upon all the necessity for the most perfect courtesy in prosecuting their inquiries. The crustiest old bachelor in town could not refuse information when a bright-looking lad stood before him, cap in hand, with Miss Ward's compliments, and will you be so kind as to give us some statistics about your manufactory?"

True to her promise, at the end of the week, Miss Ward offered to excuse from the class all who wished, but horses could not draw them out of it. "I never imagined it would be like this when I said I'd leave school rather than go into a geography class," said Walter, shame-facedly, "I am sorry I ever said such an ill-mannered thing;" and that was the end of the rebellion.

After they had spent a week on Westering, they took up their county, drawing its map, locating and naming its townships, tracing the windings of Spoon River and Crooked Creek, which wander aimlessly around through half the townships, marking the railroads which radiate in all directions from Westering, and noting the towns which have sprung up along their routes. Having fixed in mind these home-surroundings, they reached out to neighboring cities, learning their direction and distance from Westering, their position, relative and absolute, their size, peculiar features, industries and the like. Westering is connected by railroad with Chicago, Quincy, Peoria and Burlington. These cities were studied first, and after them others in the order of their connection, either geographically or commercially, with Westering. Here, as everywhere, Miss Ward utilized the peculiar talent or advantages for gaining information of each. For example, Johnny was a train-boy running to Burlington each day after school, and returning next morning. Of course he knew all about Burlington and intervening points. Mary's father was a jeweler, so Elgin with its watch factories was assigned to her. Ella had an aunt living in Bloomington, whom she often visited, so Normal University was her portion. Thus the principal places in the State were studied.

Now, they were ready for the State as a whole; all fear of map-drawing having vanished long ago, they drew the map of Illinois, thus fixing in mind its boundary lines and rivers, and adjacent States. The scholars feared that as soon as they passed beyond the circle of personal observation, they must return to the dull routine-work they had so learned to hate; but Miss Ward had another plan for them. On the board was placed this synopsis:

Position, outline, boundaries, surface slope, water courses, soil, productions of the farm, the garden, the shop, the mine; inhabitants, industries, education, religion, government.

"If we arrange what we learn in some order, we shall remember it much better," she said; "We will use this order in studying our State and all States and countries. Find out all you can about the topic for the day; we will put our facts together, and among us all, gain a thorough knowledge of the subject."

And they did; each studied books as enthusiastically as he had worked, gaining information concerning his own city. The facts thus gained, being systematically arranged, were not easily forgotten. More than this, they found that many things they had learned during those weary years when geography seemed an utter abomination, and which being only isolated facts, had slipped out of memory, now came back, marshaling themselves into rank in their proper places. In twelve weeks' time the class was again examined, and passed the ordeal triumphantly. But far more important than this result, geography became to them one of the most interesting studies; and as Miss Ward led them to note the intimate relations of the "Earth and Man"—how the physical conditions of a country influence its commercial relations, its industries, manners and customs, in short, its whole civilization, and how indissolubly connected are geography and history—the study once so much despised, appeared to them, as it is, the beautiful foundation on which rests much of our practical knowledge.

MARY ALLEN WEST.

OUR PUBLIC SCHOOLS.

Any one who has given attention to the subject of Popular Education has probably realized the difficulty of obtaining any information bearing upon the subject as applicable to the masses in this country. The common school system of the United States may be said to be the result of experience and observation, based upon the necessities of the case, rather than a systematic or well-matured plan, based upon philosophic inquiry or scientific investigation; hence the difficulty of obtaining other than merely statistical information upon the subject. While we have page after page of carefully-worded legislative enactments and legal decisions, for the government of common school authorities, and volume after volume of carefully-compiled statistical records of what has been accomplished, and what amount has been expended in its accomplishment; it is nevertheless a fact, that with the exception of an occasional suggestion, thrown out by some State Superintendent, who by chance happens to be the right man in the right place, which is rarely the case; or, perhaps, in an annual address of the president of a State or local board, and it generally of a spread-eagle character; we have little or nothing emanating from school authorities calculated to advance the cause or promote the interests of education in our midst.

There can be no doubt that this is, to a greater or less extent, due to the fact that the system of management adopted is based upon the general and popular idea, so flattering to us as a people, that we are fully competent and entirely capable of managing our own affairs; which, however true it may be in other matters, presents a somewhat novel claim in its application to education, for it supposes such a degree of intelligence on the part of the masses as to render them capable of determining not only what direction shall be given, and to what degree it shall extend, but the ways and means of its successful accomplishment—problems among the most difficult which have engaged the attention of eminent men.

Would it not be well, however, to give the matter a careful consideration with a view of effecting, or, at least, pointing out where such modifications of our present system and methods

might result in effecting some beneficial changes? And that we may be better able to comprehend the subject, let us endeavor to find what is defective before attempting modifications, or else we may mistake complication for improvement, or novelty for worth. First, then, and perhaps the most difficult to accomplish, is to create a greater interest in the subject of popular education on the part of the masses. We are as a people deeply sensible of the importance of education; but, unfortunately, more ready to laud it, than to labor for it; and it is one of the discouraging views of society that hardly any one seems to appreciate either the subject or the importance of securing the services of able and competent persons in the capacity of teachers. It has been wisely said that "education is the chief defense of nations," and if this be a truism in its application to nations, it is or should be eminently so in its application to our form of government, and it behooves us as a people to examine the subject carefully; not exactly upon the principle—"in time of peace, prepare for war," but upon the more noble principle—in time of peace prepare not only to avoid war, but ignorance, vice, superstition and corruption—evils of society which history and experience prove to be more destructive to the liberties, peace and prosperity of a people than war itself; and as public education must be recognized as the great instrumentality by which the masses can be elevated to that position by which alone they are or can be qualified to discharge the responsible duties devolving upon them as American citizens, let us inquire what is being done, and to what extent we, as a people, can advance the cause in our midst.—*Penn. Monthly for October.*

DOES the educator's work deteriorate him? There is something about the teacher's duties that cannot be beneficial—that is certain. Whether it is because he already knows the truths or facts, and therefore gives no attention to them, but is wholly engaged in seeing his pupils absorb them, or whether having learned enough already to obtain a certificate, he makes no further effort to improve his own mind, the result is that teachers frequently stand still or go backward. There is but one remedy, do *the same work that your scholars are doing*—STUDY.

LIGHTNING IN JOHNNY'S HAIR.

By Adam Stwin.

"Combs can't blow, can they?"

Could you guess what Johnny meant by such a queer, back-handed question? I couldn't, nor his sister Mary, either. I was quite sure, however, that he meant something sensible, if one could only get at it; but Mary was doubtful.

"Blow what?" she asked, not so pleasantly as she might.

"Why, blow air," said Johnny, "to make wind."

"Of course not, you silly child; what makes you ask such a question as that?"

Mary thinks Johnny is a pretty bright little fellow in general, but on particular points she is always ready to call him a dunce, without stopping first to find out what he really means to say. The trouble is, she knows so little herself that she thinks she knows everything, at least everything worth knowing; and Johnny is all the time troubling her with questions that she has no answer ready for.

"What have you seen to make you ask that question?" I inquired.

"I didn't see anything," said Johnny; "I just felt it—like some one breathing softly on my face and hand when I held my comb near."

"Nonsense," said Mary, "you just imagined it."

"No, I didn't," Johnny insisted; "I felt it really, this morning, when I was combing my hair."

"Oh," said I, suspecting the cause of his difficulty; "what kind of a comb was it?"

"A black comb," said Johnny.

"Horn, or rubber?" I asked.

"It's a rubber comb," said Mary.

"How did your hair behave when you were combing it?"

"Mean as anything," Johnny replied. "It stuck up like Mary's when it's frizzed, and wouldn't stay anywhere."

Part of that was for Mary's benefit. Johnny likes to tease her.

"Did you think the comb made it do that by blowing it?" I asked.

"Not at first," said Johnny: "the comb seemed to crackle, and I put it to my ear to listen; then I felt the wind on my cheek."

"Suppose you bring the comb here," said I, "and show us what it did."

Johnny ran off for the comb, but came back quite crestfallen.

"It won't do it now," he said.

"As much as ever!" cried Mary, triumphantly.

"But it did this morning, truly," he said, rather humbly.

"Pshaw!" said Mary; "you imagined it."

Like many another discoverer, Johnny had to learn what it is to be discredited and ridiculed for knowing too much. Because Mary had never noticed what he described, she was as ready as older people to cry "nonsense," "impossible," and all that sort of thing, without stopping to consider whether he might not be in the right after all."

"You had better try it again some other day," I said to Johnny. "Try different combs. Try in the dark, too."

"What for?" Johnny asked.

"You might see something," I said.

"In the dark?"

"Yes, in the dark."

Johnny wondered how that could be; and he wondered still more when I suggested that it might be a good plan to try the comb also on Humpty Dumpty—that's his shaggy dog.

Two or three mornings after, Johnny came pounding at my door before breakfast; when I let him in he cried: "It blows now, sure!"

"What blows?"

"Why! the comb."

I took the comb from his hand and putting it to my cheek, said, "I don't feel any wind from it."

"That isn't the way," he said, reaching out for the comb. "You must do this first," and he ran the comb rapidly through his hair a few times, then held it to his cheek, saying, "I can feel it plainly."

"See if it will blow these," I said, stripping some bits of down from a feather and laying them upon the table.

Johnny repeated the combing, then held the comb near the down, expecting to see the light stuff blown from the table. To

his great surprise it was not blown away at all, but on the contrary it sprang suddenly toward the comb, then dropped off as suddenly.

"That's queer," said Johnny.

I excited the comb again and held it near the back of my hand, calling Johnny's attention to the fact that all the fine hairs stood up when the comb came near them.

"When you hold the comb near your cheek," I said, "the downy hairs stand up like that, and the feeling is just like that of a breath of air."

"Then it isn't wind that comes from the comb?"

"No, it is not wind."

"Maybe the comb is a magnet," suggested Johnny, seeing its attraction for light hairs, dust and the like, as I held it over them. I took a small magnet from my table-drawer and held it near the feathers and hair. It did not stir them no matter how much I rubbed it. It picked up a needle though, very quickly. Then I rubbed the comb, and though it attracted the feathers it had no effect on the needle.

"Is that like a magnet?" I asked.

"No," said Johnny.

"When the needle springs to the magnet it sticks there; but when the hair or down springs to the comb it flies away again instantly."

"It is very queer," said Johnny.

"Try this horn comb," said I.

Johnny tried it, but comb his hair as much as he might, the horn would not draw anything. Then he tried a shell comb and an ivory comb, neither of them acting as the rubber comb did.

"I don't understand it at all," said Johnny.

"Nobody does fully," said I; "but if you keep trying you may learn a good deal about it in time."

Then we went to breakfast. It was several days before the subject was brought up again. "I've been watching a long time," said Johnny that evening, "I began to think it would never happen again, but it's a first-rate day to-day."

"Have you found out anything new?" I asked.

"Not much," said Johnny. "I tried Humpty and the comb crackled like everything. What makes it do that?"

"I think we'll have to study that to-night," I replied. "Where's Humpty?"

"In the kitchen. Shall I call him?"

"If you please; bring pussy, too."

Johnny was soon back with Humpty and Nebuchadnezzar—that's pussy. We call him Neb, for short. Then we went into the library and put out the lights.

"How can we see what the comb does?" Johnny asked.

"Some things can be seen in the dark," I replied. Then I drew the comb briskly through Johnny's hair, making it snap and sparkle beautifully. "See," I said, bringing the teeth of the comb opposite my knuckle, "this is what makes the snapping.

"How pretty!" Johnny cried, as the tiny sparks flew from the comb to my knuckle. "What is it?"

"Lightning," said I.

"Lightning! In my hair?"

"Certainly," I said. "Let me comb out some more."

Johnny was almost afraid of himself when I brought another lot of sparks from his head.

"Folks had better look out when I'm around," said the little fellow, pompously. "Mary says I make more noise than a thunder-storm sometimes; I guess it's the lightning in me. Somebody'll get hit yet."

"Not very severely let us hope," said I, laughing. "Suppose we try Humpty. Maybe he's a lightning-bug, too."

Sure enough, when we passed the comb through his shaggy coat the sparks flew finely. So they did when we rubbed him with the hand.

"Let's try Neb," said Johnny; "here he is under the sofa; I can see his eyes."

But Neb had no notion of being rubbed the wrong way. As soon as the sparks began to show his patience gave out, and he went off with a rush.

"I guess Neb's lightning goes to his eyes and his claws," said Johnny.

After that we tried the sheepskin rug, Mary's muff, and several other things of the sort, getting sparks from all of them.

"Everything seems to have lightning in it," said Johnny.

"Apparently," said I, "but you can't make it show in everything alike; any way, not by rubbing. Try the chair back, the table, the sofa, and such things. Generally when two things are rubbed together the lightning—or *electricity* as it is commonly called—escapes quickly. When it can't do that, it accumulates—as it does in the rubber comb—and goes off with a snap when it gets a chance. When a cloud contains more

electricity than it can hold, some of it jumps to another cloud or to the earth, making a flash of lightning. The thunder is its prodigious snap and the echoes of it. Are your slippers quite dry?"

"I think so," said Johnny, wondering what that had to do with lightning.

"I think the furnace has been on long enough to make the carpet quite dry, too," I said, turning just a glimmer of light on. "If it is, you can make a little thunder-storm of yourself easily."

"How?" Johnny asked eagerly.

"Just skip around the room a few times without taking your feet from the carpet."

Johnny spun round like a water-beetle for a minute or two; then I stopped him and told him to reach out his forefinger. When he did so, I reached my forefinger to his, and as the points came together *snap!* went a spark between them, whereat Johnny cried, "Oh!" and put his finger to his mouth.

"Did it burn you?"

"No," said Johnny, "but it scared me."

He was not so badly scared, however, but he wanted to try it again and again, while I turned up the light and went on with my reading. By-and-by Humpty came out from under the sofa to see what was going on, and Johnny sent a spark into his nose. It didn't hurt him any, though it surprised him not a little.

"Wouldn't it be fun," said Johnny, "to give Mary a shock?"

"Charge yourself again," I said, "then come to me with your hands down."

Johnny did as I bade him, whereupon I stooped and kissed him on the mouth. It was his turn to be surprised that time.

Just then Mary came to tell the young lightning catcher that it was time to go to bed.

"All right," said the little rogue cheerily, skipping about the room. "Kiss me good night, Mary, but don't touch me with your hands," he said at last, demurely holding up his mischievous mouth.

Mary gave the kiss, and got in return what she didn't expect.

"You little rascal!" she cried, "you've got a pin in your mouth."

"No, I haven't," he said.

"It's a piece of rubber, then."

"No, it isn't rubber."

"What was it?"

"Lightning," said Johnny. "See!" and he skipped a few times across the floor, then gave her a spark from his finger. Then he ran off to bed laughing at Mary's bewilderment.—*Christian Union.*

DEPARTMENT OF PUBLIC INSTRUCTION.

STATE OF CALIFORNIA, DEPARTMENT OF PUBLIC INSTRUCTION,
SACRAMENTO, February 4, 1875.

To whom it may concern : Learning that efforts are being made to introduce immediately some of the new books recently adopted by the State Board of Education, I hereby notify all parties interested that none of the new books can be used before June 1, 1875; and any district using them previous to that date will lose its apportionment of school moneys. In the case of the Readers, the Sixth District Court has granted an injunction against the introduction of the Pacific Coast Series of Readers until the legality of the action of the State Board of Education in adopting said Series of Readers, can be judicially and finally determined.

HENRY N. BOLANDER, *Sup't of Public Instruction.*

BY reference to the proceedings of the State Board of Education, it will appera that the text-book matter stands as follows: In reading, the Pacific Coast Series of Readers has been adopted in place of McGuffey's Series. In writing, the Spencerian copy-books have been adopted. In orthography, no text-books have been adopted; spelling must be taught as provided for in the Course of Studies. In arithmetic, Robinson's Series was re-adopted; no adoption was made in Intellectual Arithmetic, and Colburn's must be continued in use till otherwise ordered by the State Board. In geography, Cornell's Primary and Physical were adopted in place of Monteith's Introductory, Manual and Intermediate, adopted four years ago. In grammar, Brown's First Lines were re-adopted. In physiology, Cutter's First Book on Analytic Anatomy, Physiology and Hygiene, Human and Comparative, was adopted. The adoption of text-books in the remaining studies, viz: history of the United States, natural philosophy, natural history, elements of form and industrial drawing, were postponed for six months. The Board declined to adopt any text-book in vocal music.

WE notice an error which has crept into the resolution adopted by the State Board in reference to Swinton's *Language Series*. The resolution authorizes and requests each *County Superintendent* to purchase the series with the library fund, and to place it in each district library. We suppose that the resolution meant to authorize and instruct each *Board of Trustees and of Education* instead of *County Superintendent*, to do so, as according to law the Board of Trustees and of Education alone has the power to expend the library fund. Section 1712 of the Political Code reads: "The Boards of Trustees and of Education must expend the library fund, together with such moneys as may be added thereto by donation, in the purchase of school apparatus and books for a school library."

For the examination of teachers the following rules were passed:

1st. No certificate of any grade must be granted to any person under eighteen years of age.

2d. Applicants must be examined in the following order: Written grammar, spelling, written arithmetic, history of the United States, theory and practice of teaching, mental arithmetic, geography, physiology, algebra, natural philosophy,

penmanship, natural history, reading, vocal music, word analysis, composition, drawing, Constitution of the United States and of California, school law and grammar.

3d. No certificate must be issued to an applicant who receives less than fifty credits each in written arithmetic, grammar or orthography; and an applicant receiving less than sixty credits in each of these studies cannot obtain a certificate, above a third grade.

THE STATE BOARD OF EDUCATION

Met at the office of the Superintendent of Public Instruction, January 5, 1875, at 3 o'clock P. M., Governor Booth in the chair.

Present—Governor Booth, Messrs. Allen, Crawford, Denman, Kelly, Kennedy, Lynch, McMeans and Bolander.

The minutes of the previous meeting were read and approved.

On motion, the request of A. B. Learned to be admitted to the sessions of the Board as reporter for the Stockton *Herald*, was denied, it appearing that Mr. Learned represented several Eastern publishers, and was, furthermore, no regular reporter.

On motion of Mr. Bolander it was resolved that no further proposals for supplying text-books will be received after the first proposals are opened.

On motion of Mr. Lynch it was resolved that the matter of text-books be considered according to the order of the studies mentioned in Section 1,665 of the Political Code.

The resolution, introduced by Mr. Lynch, that the publishers, in submitting their bids, shall state the retail price at which they will furnish their books in San Francisco, and also the discount they will allow the trade, was adopted.

Mr. Denman offered the following resolution, which was adopted:

Resolved, That bids be opened at 10 o'clock to-morrow morning.

Mr. Bolander offered the following resolution:

Resolved, That no proposals once before the Board can be withdrawn, except the house submitting the proposals desires to withdraw its books; and that no proposals once opened and read to the Board can be altered or supplemented.

As a substitute, Mr. Allen offered the following, which was adopted:

Resolved, That whenever the bids upon any text-book be opened, the Board will take final action upon that book before adjournment.

On motion of Mr. Denman it was resolved that separate bids must be made for each text-book or series of text-books on any one subject.

A recess of fifteen minutes was now taken. At 4:25 the Board was called to order again.

On recommendation of the State Board of Examination, Life Diplomas were granted to the following teachers:

Bernard, Miss A. S., Alameda Co.
White, Miss Louise E., Alameda Co.
Dooner, John, Calaveras County.
Watkins, Emory, El Dorado.
McCarty, A. P., Lake County.
McFadden, Miss Agnes, Los Angeles Co.
McDonald, W. P., Los Angeles Co.
Lubeck, Mrs. Julia M., Placer Co.
McDonald, Mrs. A. H., Sacramento.
Baldwin, Miss Nellie, San Francisco.
Chalmers, Miss Annie B., San Fran.
Grant, Miss Ella G., San Francisco.
Hucks, Miss Annie E., San Francisco.
McBride, H. E., San Francisco.
Sankey, M. J., San Francisco.
Lovett, C. M., San Luis Obispo County.
Metzger, C. L., Tuolumne County.
Freman, G. N., Yolo County.
Cross, C. W., Yuba County.
Davis, Mrs. Imogene W., Yuba Co.
Steel, Thomas H., Yuba County.

A petition asking for a Certificate of Incorporation for the "Wilson College," Wilmington, Los Angeles County, was presented and read, and the petition granted.

On motion of Mr. Allen, the credits to be allowed upon the various studies in which applicants for teachers' certificates are required to be examined, were fixed as follows: Written arithmetic, 100; mental arithmetic, 50; written grammar, 100; oral grammar, 25; geography, 50; history of the United States, 50; theory and practice of teaching. 50; algebra, 50; physiology, 50; natural philosophy, 50; constitution of the United States and of California, 25; school law of California, 25; penmanship, 25; natural history, 50; composition, 50; reading 50; orthography 100; defining (word analysis) 50; vocal music, 25; industrial drawing, 25.

On motion of Mr. Allen, Boards of Examination were directed to conduct the examinations in the following order: General questions, grammar, spelling, arithmetic, history of the United States, theory and practice of teaching, mental arithmetic, geography, physiology, algebra, natural philosophy, penmanship, natural history, reading, vocal music, word analysis, composition, drawing, constitution of the United States and of California, school law, oral grammar.

The resolution, by Mr. Allen, that from and after this date no candidate for examination who shall receive less than fifty credits each in written arithmetic, grammar, or orthography, shall be entitled to a certificate of any grade, and no candidate receiving less than sixty credits in each of the above studies shall receive a certificate above a third grade, was, after full discussion, unanimously adopted.

On motion of Mr. Allen, the following resolution was adopted:

Resolved, That county and city superintendents shall, after the papers in the first three subjects shall have been examined, notify all applicants falling below the above minimum, that they are excused from further examination at that session.

On motion of Mr. Lynch it was resolved that the percentage upon which City Boards of Examination shall grant First, Second or Third grade certificates shall be the same as that prescribed for County Boards of Examination.

The matter of enforcing the State Course of Studies was brought up, and after considerable discussion, its further consideration postponed.

Mr. Lynch moved that the present Advanced Grade be expunged from the course of studies. Carried.

On motion, the following resolution was adopted:

Resolved, That a committee of three be appointed by the chair, to prepare a high school course of study for the different high schools of the State, said committee to report at the next meeting of the Board.

Resolved, That this committee be and are hereby instructed to confer with the principals of existing high schools in the State, and the President of the University, in preparing such course.

The Chair appointed Messrs. Allen, Kennedy and Bolander as such committee.

Mr. Lynch presented a communication from the Secretary of the State Grange, enclosing a supplementary report by the State Grange committee on "Education and Labor," addressed to the Executive Committee of the State Grange. A motion to refer the report to a committee of three was lost.

The following resolution, introduced by Mr. Crawford, was adopted:

Resolved, That the County Boards [of Examination] have the power to limit the time during which any examination paper must be completed.

The Board then adjourned till next day, 10 o'clock A. M.

SECOND DAY'S SESSION.

WEDNESDAY, January 6, 1875.

The Board met, pursuant to adjournment, at 10 A. M. Full Board present; Governor Booth in the chair.

Reading of the minutes of the previous day's session dispensed with.

The matter of the adoption of text-books in reading was first considered. Proposals for supplying readers were placed before the Board, as follows:

From Messrs. A. L. Bancroft & Co., of San Francisco, to supply the Pacific Coast Series of Readers at the following prices: First Reader, 20 cents; Second Reader, 35 cents; Third Reader, 55 cents; Fourth Reader, 60 cents; Fifth Reader, $1. These retail prices hold good in San Francisco for the whole four years for which the books may be adopted. Discount: to the trade, 20 per cent; to wholesalers, 30 per cent. An even exchange for McGuffey's Readers to be given as follows: Pacific Coast First Reader for McGuffey's First Reader; Pacific Coast Second Reader for McGuffey's Second Reader; Pacific Coast Third Reader for McGuffey's Third Reader; Pacific Coast Fourth Reader for McGuffey's Fourth Reader; Pacific Coast Fifth Reader for McGuffey's Fifth Reader. Books sent for exchange to be in sufficiently good condition for continued use in school, and to be accompanied by a certificate from the teacher, or other school officer, that the book offered for exchange is the property of a pupil, and designed for use in school by said pupil. One or more depots of exchange to be established in each county until the use of the books becomes mandatory. Such even exchange to be made during the whole four years for which the books may be adopted, at the publishers' place of business in San Francisco. The stock supplied to the schools to be in all respects as good as the samples placed before the Board. The publishers further agree to replace at their own expense, during the entire four years, any book sent to them which has come to pieces through defect in binding, or which is defective in arrangement of signatures, or any other respect in which they, as manufacturers, are properly responsible. The publishers further agree that the press-work and binding of their books shall all be done within the State of California, for and during the whole four years for which the books may be adopted.

From Messrs. Wilson, Hinkle & Co., of Cincinnati, O., to supply the McGuffey's New Eclectic Series of Readers, at the following rates: First Reader, 20 cents; Second Reader, 35 cents; Third Reader, 50 cents; Fourth Reader, 60 cents; Fifth Reader, 75 cents. These retail prices to hold good for the full time for which the books may be adopted. Discount: to the trade, 20 per cent.; to importers, 30 per cent.

From Messrs. Jno. P. Morton & Co., of Louisville, Ky., to supply Butler's Series of Readers, as follows: First Reader, 20 cents; Second Reader, 40 cents; Third Reader, 55 cents; Fourth Reader, 65 cents; Fifth Reader, $1 25; Butler's Goodrich's Fifth Reader, $1 25; Butler's Goodrich's Sixth Reader, $1 65. A depot to be established in San Francisco, at which the books will in no case be sold at a higher retail price than herein given.

Mr. Kennedy offered the following resolution:

Resolved, that we hereby adopt the Pacific Coast First, Second, Third, Fourth and Fifth Readers, on the terms and conditions named in the proposal of the publishers, Messrs. A. L. Bancroft & Co. Said readers to go into use in the public schools of California on June 1st, 1875, their use to be immediate and mandatory six months thereafter.

After a protracted discussion the resolution was adopted by the following vote:

Ayes.—Messrs. Allen, Denman, Kelly, Kennedy and Lynch.

Noes.—Messrs. Crawford, McMeans, Bolander and Gov. Booth.

The Board thereupon adjourned till half past one P. M.

AFTERNOON SESSION.

At 2 o'clock P. M. the Board was called to order again by the President.

The following resolution, offered by Mr. Denman, was adopted:

Resolved, That Bancroft & Co. be required to enter into a bond of $20,000, for the faithful performance of the contract to furnish the Pacific Coast Readers, in accordance with the terms adopted by the State Board of Education.

Mr. Bolander requested and received permission to spread the following protest upon the minutes:

"I solemnly protest against the adoption of the Pacific Coast Series of Readers in place of the McGuffey's Series of Readers, at present in use in the public schools of this State, for the reason, among many others, that the Pacific Coast Series of Readers is adopted in plain violation of subdivision 3, of Section 1,874, of the Political Code, as this Series is inferior in contents, paper and binding, and is to be sold at a higher retail price than the Series now in use."

The matter of adopting text-books in penmanship was next considered. Proposals were received as follows:

From Messrs. Ivison, Blakeman, Taylor & Co., of New York, to supply the Spencerian Copy Books at the following rates: Shorter Course, comprising three books, 25 cents per set, or 8⅓ cents each; Common School Series, comprising six books, Nos. 1, 2, 3, 4, 4½, 5, at 75 cents per set, or 12½ cents each; new Spencerian Charts, 48 sheets, mounted on rollers, $3; unmounted, 75 cents per set; Spencerian Key, at $1 25. The books to be sold at these prices in San Francisco. Discount: 20 per cent to the trade, 30 per cent to the importer.

From Messrs. Wilson, Hinkle & Co., of Cincinnati, O., to supply Thompson and Bowler's Penmanship as follows: Eclectic Copy Books, 12½ cents each; Eclectic Primary Copy Books, 10 cents each; Eclectic Writing Cards, $4 17 per set. Discount as above.

From the publishers of the Duntonian System of Penmanship, to supply copy-books, for first introduction, at 10 cents each; to exchange the stock of P., D. & S. Books which may remain in the hands of the dealers throughout the State, for an equal quantity of such numbers of the Duntonian Books as said dealers may require, without cost to them. To send a thoroughly competent person to visit the teachers at all the principal points of the State, to illustrate and explain the Duntonian method of penmanship. Subsequent to introduction to sell at retail in San Francisco the Writing Primer at 10 cents per copy, and the copy books, ten in number, at 12½ cents each number. The books to be supplied to the schools to be in all respects equal to the samples submitted to the Board. Discount as above.

From Messrs. Woolworth, Ainsworth & Co., of New York, to supply the Payson, Dunton and Scribner's Writing Cards, for slate or paper practice in primary schools, complete in one set, at 8 cents; the short course of copy-books, consisting of four books, two of which are tracing, and two without tracing, at 8 cents each; the large regular series of the Payson, Dunton and Scribner's Writing Series, complete in thirteen books, and arranged as follows: the Common School Series, Nos. 1, 2, 3, 4, 5 and 6, the Ladies Series, Nos. 8, 9 and 10, the Supplementary Series, or Business Books, Nos. 7, 11 and 12, and a book called Alphabet Book, all of which are offered at 12 cents each; the Manual of Penmanship, $1; the Writing Tablets, on sheets, six in set, mailed to any part of the State, at $2; the same set mounted, at $3.

Mr. Allen introduced the following resolution:

Resolved, That we hereby adopt the Spencerian System of Penmanship for use in this State, to be introduced as new classes are formed, the introduction to be made mandatory before July 1, 1875.

The resolution was adopted by the following vote:

Ayes.—Messrs. Allen, Crawford, Kelly, Kennedy, Lynch, McMeans and Bolander.

Noes.—Messrs. Booth and Denman.

The resolution introduced by Mr. Denman that the Board recommend that spelling be introduced as a part of the State Course of Study, and that some text-book be adopted by this Board, was, after a long discussion, lost.

Ayes.—Messrs. Denman and Lynch.

Noes.—Messrs. Allen, Crawford, Kelly, Kennedy, McMeans, Bolander and Booth.

The resolution introduced by Mr. Bolander that this Board decline to consider any proposals on spellers, was adopted.

Ayes.—Messrs. Allen, Crawford, Kelly, Kennedy, McMeans, Bolander and Booth.

Noes.—Messrs. Denman and Lynch.

The consideration of proposals for supplying text-books in arithmetic, being next in order, proposals were placed before the Board as follows:

From Messrs. Ivison, Blakeman, Taylor & Co., of New York, to furnish Robinson's table book for 17 cents; primary arithmetic, 20 cents; intellectual, 35 cents; rudiments, 35 cents; practical, 80 cents; higher, $1 15; elementary algebra, $1 25; university algebra, $2 00; geometry, $1 00.

From Messrs. John P. Morton & Co., of Louisville, Ky., to furnish Towne's mathematics as follows: Primary arithmetic, 35 cents; intermediate, 55 cents; mental, 40 cents; practical, $1 00; algebra, $1 25; and to establish a depot at San Francisco.

From Messrs. Lippincott & Co, of Philadelphia, by D. A. Learned, "agent pro tem.," to furnish Sanford's primary arithmetic at 35 cents; intermediate, 50 cents; common school, 90 cents; higher, $1 50. Discount of 20 per cent. to the trade.

On motion of Mr. Allen, Robinson's Primary and Common School Arithmetics were re-adopted.

On motion of Mr. Kennedy, Robinson's Rudiments of Arithmetic was re-adopted.

Next in order, the following proposals for supplying text-books in geography were considered:

From Messrs. A. S. Barnes & Co., New York, to furnish Monteith's Manual, with supplement, at $1 04, retail; Monteith's Physical and Political, with supplement, $1 57, retail; and as an alternate, Monteith's Introduction to Geography, with supplement, at 63 cents, retail. From these prices 20 per cent. discount to be allowed to dealers, and 30 per cent. discount to importers.

The same firm offered also the Independent Series of Geographies: the New Independent Elementary Geography, with Pacific Coast supplement, at 75 cents, and the New Independent Comprehensive, with supplement, at $1 45. Discount to dealers and to importers as above.

From Messrs. Ginn Brothers, Boston, Mass., to furnish Hall's Our World, First Lessons, at 80 cents; ditto, Second Lessons, $1 70. 20 per cent. discount to the trade.

From Messrs. Wilson, Hinkle & Co., Cincinnati, to furnish the Eclectic Primary Geography at 71 cents; the Eclectic Intermediate Geography at $1 34; the Eclectic School Geography at $1 67. Discount: 20 per cent. to the trade; 30 per cent. to importers. In case of adoption a Pacific Coast supplement to be added to each book adopted, without raising the price of such book.

From the University Publishing Company, to furnish Maury's First Lessons in Geography at 52¼ cents; Maury's World We Live In, at $1 04⅛; Maury's Manual of Geography, at $1 66¾; Maury's Physical Geography, at $1 87½. Discount: 20 per cent. to the trade, and 30 per cent to the importer.

From Messrs. D. Appleton & Co., New York, to furnish Cornell's Primary Geography at 75 cents, and Cornell's Intermediate Geography at $1 25. Cornell's Physical Geography, at $1 33, was offered as a supplemental book for Normal and High Schools. Discount: 20 per cent. to the trade, 30 per cent. to the importer.

Mr. Kennedy moved that the Board hereby adopt Cornell's Primary and Physical Geographies, to go into use in the public schools of California, on the 1st of July, 1875, their use to be mandatory six months thereafter.

The books were adopted separately by the following vote: the Primary Geography:

Ayes.—Messrs. Allen, Kelly, Kennedy, Lynch, McMeans, Bolander and Booth.
Noes.—Messrs. Crawford and Denman.

The Physical Geography:

Ayes.—Messrs. Allen, Kennedy, McMeans, Bolander and Booth.
Noes.—Messrs. Crawford, Denman, Kelly and Lynch.

The Board adjourned till next day, at 10 A. M.

THIRD DAY.

THURSDAY, January 7, 1875.

The Board met, pursuant to adjournment, at 10 A. M. Full Board present; Governor Booth in the chair.

Reading of the minutes of the previous day's session dispensed with.

Mr. Denman rose to a question of privilege, and asked and received permission to spread upon the minutes the following protest:

Whereas, Dr. H. N. Bolander, State Superintendent, has been allowed to spread upon the records of this Board his protest against the adoption of the Pacific Coast Readers, which are to be introduced by an even exchange for the books now in use, thereby saving parents any extra expense, I therefore desire permission to enter my protest against the adoption of Cornell's Geographies in place of Monteith's, now in use. Since the publishers of Cornell's Series have not offered an even exchange, the parents of California will be compelled to incur a extra expense for this change. I also desire to protest against the adoption of this series of books, because it is in plain violation of subdivision 3, Section 1874, of the Political Code.

At this point Mr. Blanchard, of the Attorney-General's office, to whom had yesterday been informally submitted the question whether Messrs. Bancroft & Co. could be required to enter into bonds for the faithful performance of their contract, and of the value of the bond if given, appeared before the Board, and cited a New York case in point, in which it is decided that upon a bond entered into with the State, which bond is not required by statute, the State can recover only nominal damages. The right of action would accrue to the third parties interested; but, in the present instance, where the amount involved would be small, and the questions as to exchange and serviceableness of books so numerous, it would in effect be valueless.

On motion of Mr. Kelly the resolution heretofore adopted requiring Messrs. Bancroft & Co. to give a bond in $20,000, was rescinded.

The State Superintendent was then instructed to send circular letters to all the County Superintendents, directing them to collect the books now in use ready for exchange.

On motion of Mr. Denman the Board requested the publishers of Cornell's Geographies to add as a supplement to the Primary and the Physical Geography, in accordance with the publisher's bid, a map of California and of the Pacific Coast States and Territories, with appropriate text.

Mr. Allen asked for and obtained the permission of the Board to furnish the Sacramento newspapers with a statement of the actual cost involved in the change of readers voted by the Board.

Mr. Soper, the agent of the publishers of Cornell's Geographies, here appeared before the Board, and the resolution regarding the additional maps and text was explained to him.

Mr. Soper stated that as the Physical and Primary Geographies were of different sizes, a map as required by the resolution would have to be prepared expressly for the latter. The resolution, and the bid and supplemental bid acted upon the day before were handed him, with a request to prepare another bid.

The following proposals for supplying text-books in grammar were placed before the Board:

From Messrs. Jno. P. Morton & Co., of Louisville, Ky., to furnish Butler's Introductory Lessons in English Grammar, at 20 cents; Butler's Practical Grammar of English Language, at 85 cents; Butler's Practical and Critical Grammar of English Language, at $1 00; Mureh's Child's Grammar, at 65 cents; Bonnell's First Lessons in English Composition, at 80 cents; Bonnell's Manual of English Prose Composition, at $1 50. Depot to be established in San Francisco; retail prices not to be raised for the full period of four years for which the books may be adopted.

From Messrs. Harper Bros., of New York, to furnish Swinton's Language Series as follows: Language Primer, at 34 cents; Language Lessons, at 42 cents; School Composition, at 42 cents; Progressive Grammar, at 63 cents. Discount: 20 per cent. to the trade; 30 per cent. to importers. Agencies to be established at San Francisco, Sacramento, San Jose, Stockton, Oakland and Santa Rosa, at which places, for ninety days after the books go into use, the following exchanges of the text-books now in use will be made: Brown's First Lines in Grammar and 20 cents in exchange for the Language Primer; Brown's Institutes of Grammar and 25 cents for Language Lesson or School Composition.

From Messrs. Wm. Wood & Co., of New York, to furnish Brown's First Lines of English Grammar, at 45 cents; Brown's Institutes of English Grammar, at $1.

From Messrs. Wilson, Hinkle & Co., of Cincinnati, to furnish Harvey's Elementary Grammar, at 40 cents; Harvey's English Grammar, at 79 cents. Discount: 20 per cent. to the trade; 30 per cent. to importers.

From Mr. A. Waldteufel, of San Jose, Cal., to furnish Lighthall's Analysis, Parsing and Composition, at 35 cents; 33⅓ per cent. discount to dealers.

On motion of Mr. Denman, Brown's Series, was re-adopted.

On motion of Mr. Denman, it was resolved that Harper's Language Series be adopted by this Board, as reference works for teachers, and that each County Superintendent [each Board of Trustees and of Education? see Section 1712 of the Political Code] be authorized and requested to purchase them with the library fund and place them in each district library.

Mr. Allen, in order to be at the Normal School by Friday morning, was excused from further attendance.

For supplying text-books in physiology proposals were received:

From Messrs. Harper & Brothers, of New York, to furnish Dalton's Physiology and Hygiene, at $1.25.

From Messrs. J. B. Lippincott & Co., of Philadelphia, to furnish Cutter's physiologies as follows: First Book on Analytic Anatomy, Physiology and Hygiene, Human and Comparative, at 90 cents; Second Book, at $1 50; New Analytic Anatomy, Physiology and Hygiene, Human and Comparative, at $1 70.

From Messrs. A. S. Barnes & Co., of New York, to furnish Steele's Fourteen Weeks in Physiology, at $1.25.

On motion of Mr. Denman, Cutter's First Book on Analytic Anatomy, Physiology and Hygiene, Human and Comparative, was re-adopted.

The adoption of text-books in natural philosophy, natural history, elements of form and industrial drawing, was postponed for six months. On motion of Mr. Crawford, the Board declined to adopt any text-books in vocal music.

On motion of Mr. Kennedy, it was resolved that no certificate of any grade shall be granted to a person under eighteen years of age.

Mr. Kennedy, for Mr. Allen, offered the following resolution, which was adopted:

Resolved, That while the course of study prescribed by law should be strictly adhered to with pupils attending the schools from year to year, yet a wise discretion should be used by Superintendents and teachers in deciding how closely it should be followed with those pupils who are in school but a few months in the year, or who, from their age or other circumstances, are soon to leave the public schools.

On motion of Mr. Denman, the State Board of Education invited the teachers and school officers of California to meet at the State Normal School, at San Jose, during the 1st, 2d and 3d of next June, for the purpose of holding a State Educational Convention.

On motion of Mr. Denman, it was ordered that the full minutes of the present session of the Board be published in the CALIFORNIA TEACHER.

The motion of Mr. Kennedy that the Board reconsider the vote by which Brown's Grammars were adopted, was lost.

Mr. Soper presented the amended bid of the publishers of Cornell's Geographies:

Cornell's Primary, 75 cents; Intermediate, $1 25; Physical, $1 48. Discount to dealers, 20 per cent.; wholesalers, 30 per cent. Will insert in Primary and Physical a special map and geography of California and the Pacific Coast States and Territories, to be approved by the State Board. Agencies to be established at San Francisco, Sacramento, San Jose, Stockton, Oakland and Santa Rosa. Introductory exchange to be made as follows: Monteith's Introduction for Cornell's Primary for 45 cents; Monteith's Intermediate and Physical, or Physical and Political, for Cornell's Physical for 90 cents. All books to be exchanged, no matter how worn or worthless they may be.

On motion of Mr. Kennedy, it was resolved that the Board adopt the Primary and Physical Geographies, to go into use on July 1, 1875, their use to be mandatory six months thereafter.

On motion of Mr. Denman, it was resolved that the introduction of all new text-books be mandatory six months after the first day of July, 1875.

No further business appearing, the Board adjourned at 2 o'clock P. M., to meet at the call of the Secretary.

HENRY N. BOLANDER, *Secretary*.

BOOK NOTICES.

THE BUILDING OF A BRAIN. By Ed. H. Clarke, M. D. Boston: Jas. R. Osgood & Co. San Francisco: Payot, Upham & Co.

This work is written by Dr. Clarke, the author of the now famous book "Sex in Education." The book is divided into three parts. The first part, entitled "Nature's Working-Plans," contains the address which Dr. Clarke delivered

before the National Educational Association, at its last meeting. Dr. Clarke's argument may be briefly outlined as follows: The brain must be built up in connection with the building of the rest of the body, remembering constantly that the imperfections of the latter reflect themselves upon the former. The brain must be developed as the crown of the rest of the body, and, to a large extent, out of the rest of the body. No perfect brain ever crowns an imperfectly developed body. Moreover, in both sexes, the brain is the conservator of strength and prolonger of life. It is not only the organ of intellection, volition, and spiritual power, but the force evolved from it, more than the force evolved from any other organ, enables men and women to bear the burdens and perform the duties of life; and with its aid, better than with any surgery, can they overcome the "ills that flesh is heir to." In one sense, the process of brain-building is alike for the two sexes; in another sense it is different. It is the same for both, inasmuch as the process which evolves the best possible brain, by means of appropriate brain exercise, including cerebration, out of the underlying organization, is alike in the two sexes. It is different for the two, in so far as there are any organs, or sets of organs, in the structure of one sex that are not in the structure of the other. Provided the organization of both sexes is normal, and all their functions normally performed, the same sort of brain-work will develop the brain of each. But if the methods of education render abnormal any part of the body, or interfere with any function, there will not only be damage to the part disturbed, and friction in its functions, but the brain will suffer just in proportion to the importance of the organs disturbed, and the amount of the disturbance. The method by which Nature constructs a brain is the same for the two sexes. The parallel is complete between the sexes. The method that builds a man's builds also a woman's brain. But this identity of method in cerebral architecture, which requires that every organ and function in both sexes should have appropriate development and exercise, as a part of brain-building, implies, or rather necessitates, a difference in education between the sexes, just so far as there is a difference in organization between them, and no farther. But American female education looks upon a girl as if she were a boy, and treats her as if she were a boy, and trains her as if she were to have a boy's destiny. Such a system is unjust and discriminating against the girl. Dr. Clarke next points out, as he did *in extenso* in "Sex in Education," that a girl's peculiar organization must be recognized as a factor in education, and to assign to it its rightful position as an agent, or force, in the building of the brain.

In the second and third parts, facts and statements, derived from various sources, are exhibited, which indicate the errors and evils of our present system of female education—errors and evils which spring from the identical education of the sexes.

HOOKER'S NEW PHYSIOLOGY. Designed as a Text-Book for Institutes of Learning. By W. Hooker, M. D., revised by J. A. Scwall, M. D. New York: Sheldon & Co.

Dr. Hooker's text-books on Physiology are well known, and have become deservedly popular. The book before us is marked by the general excellences which characterize the lower books of Dr. Hooker's series of Physiologies. One serious and perhaps fatal objection must, however, be urged against the *New Physiology*, viz: the strongly theological cast which has been given to the book.

An *ex parte* statement of the descent of man, as given in the nineteenth chapter, is certainly out of place in a text-book on physiology. In writing the book Dr. Hooker seems to have been as eager to defend and propagate certain cherished doctrines, as to instruct in the principles of the science of life.

THE ELEMENTS OF PHYSICS. A text-book for Academies and Common Schools. By Sidney A. Norton. Cincinnati: Wilson, Hinkle & Co. San Francisco: Payot, Upham & Co.

On a careful examination of this work, we find in it little to commend, but much to condemn. The only commendable feature is the plan of closing each chapter with a recapitulation which gives a topical review of the subject matter of the chapter. Otherwise the plan of the book is neither original nor consonant to the new education; and the execution of this plan shows conclusively that the author is not a *teacher*.

PROGRESSIVE ENGLISH EXERCISES IN ANALYSIS, COMPOSITION AND SPELLING, BY THE USE OF SYMBOLS. By Henry W. Siglar. New York: Henry Holt & Co.

Until this book came to hand, we thought that the acme of grammatical drill had been reached, say, for instance, by Goold Brown. Cramming the pupils with definitions and rules has not proved a success; impressing these definitions and rules upon the mind of the pupil by means of diagrams has proved a failure. As a new method Mr. Siglar conceived the brilliant idea of devising a system of grammatical symbols analogous to chemical symbols, as a means of teaching grammar. When the pupil has fully mastered this new system, he will be able to determine that the following symbols: [? av.] (ppr. co. pl. 1. n.) be [ind. fort. p. int. pl. 1.] [a. c.] ? stand for "when shall we be stronger?" and that the sentence "I am to learn what stuff 'tis made of" must be turned into the symbols: (ppr. co. s. 1. n.) be [ind. pres. s. 1.] learn [inf. pres.] [[? a.] [n. c. nt. s. 3. o] (ppr. nt. s. 3. n.) make [ind. pres. pas. s. 3.] of].

We wonder only that the author found a publisher who was willing to undertake the printing of such stuff.

A PRACTICAL AND CRITICAL GRAMMAR OF THE ENGLISH LANGUAGE. By Noble Butler. Louisville, Ky: John P. Morton.

This grammar is on the plan of Goold Brown's Grammar. In the execution of this plan, the author has materially simplified the theoretical portions, and the practical exercises are unusually full and good.

THE LITERARY READER. By George R. Cathcart. New York: Ivison, Blakeman, Taylor & Co. San Francisco: A. Roman & Co.

This reader is not a compendium of English Literature; it presents only typical selections from some of the best British and American authors, from Shakespeare to the present time. The selections are prefaced by biographical and critical sketches, and numerous notes elucidate the text. On the whole, the selections are excellent, and the remarks in good taste. Several typographical errors occur which are almost unpardonable in a work of this kind. These will be corrected, however, when a second edition of the book is called for, of which we have no doubt, as the Literary Reader can profitably be substituted for most of the Manuals on English and American Literature now in use.

OUTLINES OF THE WORLD'S HISTORY, ANCIENT, MEDIÆVAL AND MODERN, with special relation to the History of Civilization and the Progress of Mankind. By William Swinton. New York: Ivison, Blakeman, Taylor & Co. San Francisco: A. Roman & Co.

Mr. Swinton is an industrious compiler of text-books, if we judge from the number and variety of books bearing his name. His histories are his best and most skillful compilations. In the work before us, Mr. Swinton has faithfully and skillfully used the labors of others, and by his happy method of arrangement, has produced a book which will do excellent service in the school-room. Of course, the book is not free from errors, but most of these are probably misprints, and will disappear before a careful revision.

The publishers have done their part well. The text is illustrated by numerous maps and wood-cuts; typography, presswork and paper are excellent.

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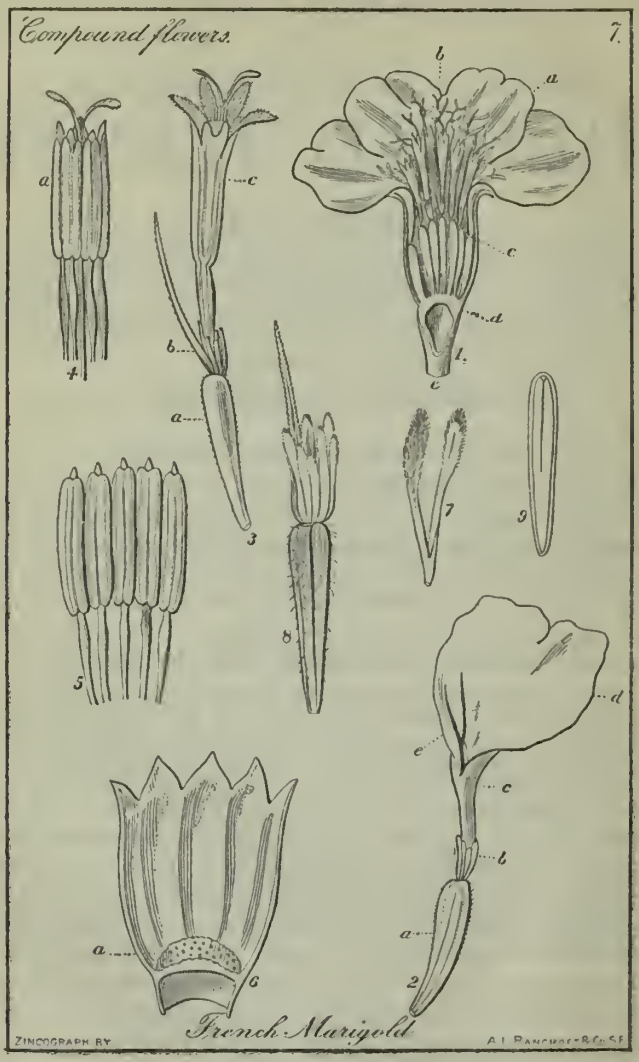
[*For the California Teacher.*]

BOTANY FOR SCHOOLS.

VII. COMPOSITE FLOWERS (*Compositæ*).

For the study of this difficult family of the vegetable kingdom, I recommend a plant quite common in our gardens in the autumn, the so-called French Marigold (*Tagetes patula*). Its flower-head (fig. 1) is surrounded externally by an olive green cup, formed of several bracts which have grown together at the edge (fig. 6); this cup is the involucre. Next the involuere are placed several florets (figs. 1 and 2), whose corolla is a broad yellow blade, rounded at the end, and striped with wide streaks of chocolate brown (fig. 2, *d*); it is all turned one way, spreading away from the flower-head, and only tubular at the bottom. Technically, they are named ligulate, which signifies strap-shaped, because in the greater part of composite flowers they are long and narrow; they are also said to form the *Ray* of the flower-head. At the base of the tube of the corolla you will find a few little narrow hairy scales (fig. 2, *b*), which stand on the top of the ovary, in place of the calyx. Botanists choose to call them the *Pappus;* although in reality they are the calyx which is only stunted and starved in consequence of its being developed amidst the constant pressure of the florets against each other. The pappus is often altogether absent, as in the Daisy for instance: but it sometimes forms a beauti-


Compound flowers.
7.
French Marigold
ZINCOGRAPH BY
A. L. BANCROFT & Co. S.F.

ful plume of feathers, which catches the wind and enables the seed to soar into the air, and to scatter itself to a distance. The delicate feathery balls of the Dandelion, and some other closely related plants, are the fruit of that plant crowned by the pappus. Below the pappus is the ovary (fig. 2, *a*), containing a single ovule; it terminates in a slender style, which passes through the tube of the corolla, and forks at the top into two stigmas (fig. 2, *e*). In time the ovary becomes a dry, hairy fruit (fig. 8), crowned with the pappus, and containing one single seed (fig. 9). Such are the *florets of the ray.*

The middle of the flower-head (fig. 1, *b*), included within the ray, is called the *Disk;* it consists of florets constructed very differently from those of the ray. To examine them conveniently you should pull one of them out (fig. 3). In the ovary you will find no difference worth naming; the pappus is also like that of the ray, only it is more perfect, and one of its scales is a sort of stiff bristle (fig. 3, *b*). The corolla is of quite another kind; it is tubular from the bottom to the top; towards the top it widens, and at last separates into five little divisions which are covered all over with hair in the inside; this kind of floret is called *tubular.* The stigmas are two (fig. 7), and project beyond the mouth of a little hollow cylinder, which is found at the orifice of all the tubular florets of the disk (fig. 4, *a*). At first sight you may be at a loss to determine what the cylinder is; but if you use a magnifying glass, you will presently discover that it is formed of five anthers, which grow together by their edges, in the same manner as petals grow by theirs, when they form a monopetalous corolla. It is easy to split this cylinder (fig. 5), and then you will see that each anther has its filament, and two lobes containing the pollen.

The broad flat part, out of which the florets grow (fig. 6, *a*), is called the *Receptacle;* it is sometimes covered with scales, or hairs, or is even pitted with hexagonal depressions, which look like the cells of a honeycomb. The receptacle of a composite flower is nothing else but an expanded part of a stem. This receptacle has generally the property of opening when the florets expand, of closing when the corollas fall off, in order to confine the young fruit; and lastly, of opening again and turning quite back to give more room to the fruit, which increases in size as it grows ripe.

Let us now pass from these considerations to a view of the sections into which the composite plants of California are divided, and enumerate such as may be easily recognized and readily procured almost anywhere in this State.

I *Section.—Tubuliflorœ.* Corolla tubular in all the perfect flowers, regularly 5—rarely 3, 4—lobed, ligulate only in marginal or ray-flowers, which, when present, are either pistillate only or neutral (having neither stamens nor pistils).

Solidago. Golden-rod.

Aster. Various indigenous species, some are also cultivated in gardens.

Bellis—Daisy. Common in gardens.

Helianthus—Sunflower. *Helianthus annus*, the common sunflower, will afford, on account of its large size, an excellent chance to study well the structure of composite flowers.

Maruta—Mayweed. Common on all roadsides.

Achillea—Yarrow. Common everywhere.

Tanacetum vulgare—Tansy. In gardens.

Artemisia—Wormwood. Many species.

Senecio—Groundsel. Many species.

Cirsium—Thistle. Many indigenous species.

Chrysanthemum. In gardens late in autumn.

Cynara Scolymus—Artichoke. Most excellent to illustrate the structure.

II *Section.—Liguliflorœ.* Corolla ligulate in all the flowers of the head, and all the flowers perfect. Juice milky.

Cichorium Intybus.—Chicory. Cultivated.

Lactuca sativa—Lettuce. Cultivated.

Sonchus—Sow thistle. Waste places around dwellings and neglected gardens.

Malacothrix Californica.

Macrothynchus grandiflorus.

The last two named species are quite common early in Spring, and are often mistaken for Dandelions.

Composite plants should be studied in a pretty far advanced state only; the seeds should be nearly ripe.

If only one half of the enumerated species, so easily procured, are carefully analyzed and closely studied, the student will get a clear and definite idea of this most difficult family of plants.

BOSTON KINDERGARTENS.

LOUISE CHANDLER MOULTON.

"Kindergarten, or no kindergarten," is a question likely to be much discussed, not only by mammas, anxious to know how best to rear and tend their human flowers, but by School Commissioners, and those in authority generally. As Boston is the headquarters of the kindergarten movement in America, perhaps some account of the theory and practice here will not be uninteresting. In my researches on this subject I went first to that dear old patron saint of the movement—herself a wise, blessed, grown-up child—Elizabeth Peabody.

"There are just four true kindergartens in Boston," she said; "all the rest are spurious." I have learned since that she ought to have included two more, recently established under the auspices of the North-End Mission, with trained teachers, and conforming to the ideas of Frœbel as far as possible. Miss Peabody seemed to regard Miss Garland's, in Chesnut street, as rather the model establishment; so I spent there one entire forenoon this week, in order to see, as thoroughly as might be, what it is to be a human flower in a child-garden. Miss Garland's hours are from 9:30 A. M. to 12:30 P. M. Her school year is thirty-six weeks in duration, and her terms are eighty dollars per annum. To have a longer school year, she said, was of no use, because such families as sent their children to her never returned to town before October, and some of them had even already gone into the country. Three hours a day she found quite long enough to keep her little people systematically busy; for busy they are every moment of the time.

She takes children of from three to seven. She would like to have them the entire four years. It is a fundamental theory of the kindergarten that no child should ever begin to learn to read until it is seven years old; and the progress of some children taught on this system, when once they began to study, has been truly marvelous. Miss Garland has an assistant, and a second school room, where a few of those who have been under her care until they were seven, are now devoting a small portion of every morning to learning to read, and they are so trained in habits of minute observation and close attention that

they seem to learn almost at sight. Her maximum number is twenty-two; but she admits so many only because among such little ones there is seldom a day when all would be present. One has a cold, another the measles, or another an anxious grandmother, who thinks the weather is too inclement; so that not more than sixteen or eighteen are likely to be in school at once, and that is as large a number as the true kindergarten ought to contain.

I wish I could make a picture for you of this room and the little people in it. There are pictures on the walls, such as Cheney's crayon of the Sistine Madonna; on brackets are graceful busts; bouquets are in pretty vases; but, above all, there is a wealth of green things growing, potted plants in large variety and in a very thrifty condition. This idea of growing plants, you must understand, is one of Frœbel's essentials. It is good for the body, he thinks, to tend them; it is good for the soul to love and watch them. Each child has one or more. His plant is as much his own as his cap or his mittens. He waters it—he picks off the dead leaves—he turns it toward the sun—he is proud of it beyond measure. The children who are present each day are allowed, as a favor, to tend the plants of the absent; and they do this faithfully and with great delight.

Imagine, in this picture-adorned, blossoming room, a dozen little tots, more or less—girls and boys being about equally represented. Fancy them seated in little chairs, so as not to tire their tiny legs, before long, low tables, just about as high as the seat of a grown-up person's chair, made of light, polished wood, divided by black lines into square inches, by which the eyes of the children presently become accustomed to measure objects. Here they sit for half an hour, busy, perhaps at building with blocks, perhaps at modeling in clay, perhaps at folding paper, or drawing, or embroidering on cards; for no John or Richard who has been trained in a kindergarten will be necessarily dependent on his wife's caprices as regards his buttons. This work goes on for half an hour, and then there is half an hour of play. But, first, I must tell you about the "occupation," as they call it.

Building with blocks sounds like mere fun, doesn't it? but, really, it exercises these little minds very actively. They were given, when I was there, a cube, which in Frœbel's list of

"Gifts" is numbered the fourth. It is composed of eight wooden oblongs, two inches in length, an inch wide, and half an inch thick. These little oblongs are shaped like bricks, you perceive, and with them the children are instructed to build. Each one must have his own idea, and plenty of room is thus given for invention. One built a bridge, with steps leading up to it, suggested by the one in the Public Garden. Another made a Summer-house, and explained his notion of its construction. Another made what he called an engine, with the gate to shut when the bell rings, and the sign-board over it. He had a spare oblong, and he set it up on end and said it was the man to tend the gate. Another little fellow, full of fun and brightness, made a school house and set a solitary oblong in front of the door. "Who is that?" asked Miss Garland. "That is Elise, coming all alone, as she did this morning," he said, laughing. Elise was a small maiden, with bright eyes and many ruffles, who was usually escorted by a nurse, but who had surprised them that morning by coming, with the utmost dignity, quite alone.

After this half hour's "occupation" was over, there came half an hour of play. The plays are set to music, and are the most admirable system of gymnastics imaginable. Let no one aspire to teach a kindergarten who cannot sing, at least tolerably, for the amusement is all accompanied by singing. They play mostly ring plays, so contrived as thoroughly to exercise the muscles, to teach grace of motion, and to prepare the little folks for future dancing. After half an hour's play comes another "occupation." Perhaps it is drawing. For this purpose they have peculiar slates, grooved into little squares a quarter of an inch each way. This aids them to be accurate in their lines. As they go on the slates are changed, the grooves becoming less and less deep, until at last they can draw as accurately on plain slates as they could at first on the grooved ones. Or perhaps they weave paper, choosing their own combinations of color. Or they model; and one little boy had shaped out of clay a surprisingly good turtle. Their leaf impressions in clay were extremely delicate and pretty. All the time their attention is alert; their habits of close and accurate observation are forming, and they are so interested in what is going on as to know no weariness. They wait on

themselves, and put away all their implements as soon as they have finished using them, with a careful orderliness which is in itself an excellent training for the future man or woman. They learn to be independent and self-helpful.

There is only one public kindergarten at present in Boston, but there is a wide-spread desire that there should be others—enough to accommodate the whole city full of little folks. The one objection is the price. It is the most expensive of public schools, because, while one teacher can and does ordinarily attend to the instruction of fifty scholars or more, the utmost number which can be taught with advantage in a single kindergarten is twenty-four. Miss Garland, in her private school, would not admit so large a number as this; but it would be the maximum number of the public kindergarten. The single public one already established is at the corner of Allston and Somerset streets, under the charge of Miss Symonds, a teacher trained by Miss Garland. The outlay for the necessary working apparatus for the first year is not less than $150, and the city hesitates to pay a teacher a full teacher's wages to instruct two dozen babies, and to add $150 more to buy them scientific toys. But the kindergarten advocates trust to this one experiment to prove their system so useful, and, indeed, so necessary, that the public cannot afford to do without it.

It is curious to notice the difference in condition of the "human flowers," as Frœbel loves to call them, in the different schools already in progress in Boston. Miss Garland has under her care the pot-house blossoms—the delicate little fairies who are brought to her by their maids or their coachmen, and who are clad in purple and fine linen. The public kindergarten contains good, hardy, native flowers, corresponding with those which grow out of doors in our gardens, fed by wholesome rain and sun and dew. And the two kindergartens which the North-End Mission has just added to its already noble work, are they not full of weeds—poor, little, vagabond, wayside thistles? Miss Garland says her great difficulty is to interest her pampered little ones—used to French dolls and unlimited bon-bons—in the simple pleasures of the kindergarten. They are accustomed to so much luxury at home that the pictures and flowers and little ornaments which would be a vision of impossible loveliness to some poverty-stricken child, seem to

them, at first, trivial and of small account. But, as soon as their intellects are fully awakened, as soon as they have tasted the pleasures of observation and invention, she has no more trouble. Yet she half seemed to envy the teachers of children who were not the curled darlings of fortune. "It would be so lovely," she said, "to give them their first glimpses of beauty and order—to open to them the doors of a new world." As to the mission schools, one of them is taught by a Roman Catholic, the other by a Protestant; so that for little wayfarers of either faith there is congenial welcome.

One cannot go to a kindergarten without becoming enthusiastic about the system. You see the little creatures, so quick, so observant, so inventive, and, above all, so bright and happy. "How do you punish them?" I asked; "for, of course, being human children, they are naughty sometimes." "They seldom need anything more than the mildest reproof," was the answer; "but when they do, it's quite sufficient to move the offender's chair away from the others, and give him a little sense of isolation."

There will be no lack of trained teachers for this system, for every year Miss Garland has a class of young ladies in the afternoons. She carefully instructs them in her theory and practice; allows them, by turns, to assist in the exercises of her own school; and, at the end of a year, she will have abundantly fitted them for their work, provided always that nature has been beforehand with her in giving them a mental and spiritual adaptation to receive her instructions. For let no one think that to teach in a kindergarten is a simple matter, requiring little culture and less genius. I know of no more exacting occupation. Infinite tact, infinite sweetness, infinite patience, are a few of the requisitions. Wordsworth's perfect woman, nobly planned, would be none too good for it. But, given the teacher at once wise and zealous, and the parent who understands that to spell words of three letters is not the only or the most important knowledge possible to an infant human being, and we can certainly, by the system of Frœbel, make our children thoughtful, reasoning, inventive, and orderly, almost from their cradles; and, above all, we can so quicken and awaken their perceptions as to render them capable of

using, to the best advantage, whatever opportunities the future may offer them.

For general interest in this system is rapidly increasing. Four or five other visitors were at Miss Garland's when I was there, among them a gentleman and his wife from Minnesota, who wished to make the system useful on the frontier. A young lady came in—one of Miss Garland's class of teachers who graduated last week—and it appeared that she had already been engaged by a number of wealthy families to keep a Summer kindergarten at Beverly Farms, which was to combine with the regular system all out-of-door delights of flowers and birds and sea and sky.

To the almost universal use of this system, there is, as I said, the only sole objection—its expensiveness. People must very thoroughly understand the importance of early training in order to be willing to pay so much to educate their babies. The State not only hesitates before one teacher and $150 worth of apparatus for every two dozen scholars, but the parent stops to consider at $80 a year for a wee object just out of its cradle; but, meantime, enough are being taught to show the worth of the system; and the few who have both the sense to perceive its advantages and the money to procure them, are likely to see their reward in the educated perceptions of their very young children.—*New York Tribune.*

JOHNNY CLIMBS INTO GEOGRAPHY.

By ADAM STWIN.

"Is this the highest mountain in the world?" Johnny asked, surprised and bewildered by the new aspect of the strange, great world we looked down upon from our high position on the top of Wildcat Hill.

Mountains were something new to Johnny. The hills of Prospect Park were the highest he had ever seen before, except some far-off ranges he caught glimpses of from the car window as we came into the country. He could hardly believe me when I told him they were as high as the one he had climbed with so much labor that bright summer morning.

"They look small," I said, "just as our house looks small away down there in the valley, because of the distance."

"There among the trees by the river? I can see it—and the white church on the hill, too, and the brick school-house. They look like toy houses! The hill looks flat almost; it's awful steep from grandpa's. Is that the mountain back there where the woods are?"

"Certainly," I said. "Don't you see the grey line where the high rocks are?"

"Everything is so queer," the little fellow went on, gradually getting used to the new appearance of things, "and so small. It's like a picture. The river looks as though I could step across it—and how far it goes."

It was a pretty sight truly to see the river winding down from the distant mountains, now still and black between wooded shores, now flickering in the sun as it dashed over rapids, here spreading round green islands, there pouring over falls or sleeping under bridges! No wonder the boy gazed with wide eyes wonderingly, as if upon a bit of fairyland.

"Where does it come from?" he inquired at last.

"The river?"

"Yes, the river."

I pointed to where a blue peak stood up against the sky, with a white cloud trailing from its top like a snowy banner, and told him that on the further side of that mountain was a beautiful lake, and the river came out of it, running between old White Cap (as the mountain's name is) and the steep mountain to the left of it.

"Are those mountains too?" Johnny exclaimed. "How smooth and blue they look, like clouds almost. Are there trees on them?"

Except where they look white," I replied. "A few years ago a great fire burned all the trees off that flat-topped one on the right, and now the bare rocks look as though covered with snow. And that white streak on the highest mountain is bare rock too. One time after a heavy rain all the trees that grew there slid down the mountain with all the loose earth, leaving that long rocky scar, as broad as the river and as long as from here to grandpa's."

"Why, it doesn't seem bigger than my hand!" said Johnny. "It must be a very great mountain—higher than this."

"Very much higher—may be as high as all these hills round here piled top of each other," I said.

Johnny looked at them a long time, trying very hard to think how big they would be. Finally he said: "Do you think this mountain will ever be as big as that?"

"No," I replied, "I don't think it ever will. It is more likely to get smaller. All the mountains round here seem to be wearing out.

"Wearing out! Do mountains ever wear out? How can they?"

"Not exactly as your hat or shoes do," I replied; "still they are constantly wearing away little by little, and must finally become much smaller than they are now. You can see for yourself."

"Can I?" Johnny asked eagerly. "What wears them—the clouds?"

Johnny had seen the rain-clouds driving over the mountains furiously, with a great roar of wind and thunder, and it was natural that he should think of them first.

"But why didn't they break down the trees, then?" he went on a moment after, doubting the correctness of his suspicion.

"It is rather what comes out of the clouds," I said.

"Oh, I know," said Johnny, "the lightning."

"The lightning helps a little, may be, but the rain does the most. You saw how muddy the river was yesterday after the shower?"

"Guess I did," said Jonny. "It spoiled the swimming."

"Where did the mud come from?"

"Out of the road."

"Some of it; but more came from the hillsides. Where do you think this white sand comes from?" I continued, scraping a handful from a clear space at the lower edge of the big rock we had been sitting on.

"The rain must have washed it there yesterday," said Johnny, seeing how fresh and moist it was.

"Where did the rain find it?"

Johnny gave a quick glance toward the top of the rock. There was nothing but clean rock to be seen that way, for we

were on the very brow of the hill. He thought a moment, then asked me to help him to the very top.

"Could the wind blow the sand here?" he inquired, after we were rested a little from our scramble up the sloping rock.

"Possibly; but this doesn't look like the sand down in the valley, and it seems too coarse to be blown so far," I replied, rubbing a little of it in my hand.

While I was speaking, Johnny's busy fingers began to flake off small scales of stone where a shallow pool of rain water stood in a little basin in the rock. I took a couple and rubbed them together, and they crumbled into sand like that I had brought from below. Johnny's eyes brightened at the sight.

"I think the sand must have come from here," he said.

"Right," said I. "Part of it at least. In the winter the water in the rock freezes and bursts off these scales, and makes them crumbly. Then the rain batters them to pieces and washes the sand away."

We slid down the rock and found quite a stream of coarse sand along its lower edge. At one point the water had overrun the grass, flattening it and scattering sand over it. Lower down it poured down over another sloping rock and united with several other little streams. The further we went the greater the rush of water seemed to have been until we came to a gully where there must have been quite a torrent during the storm. Here a good deal of sand was strewn along, with spaces of mud where pools of water still remained.

"We might follow this channel all the way down the mountain to where it joins the brook we got a drink out of coming up," I said, "but it is easier to take the path."

"Yesterday, and every day when it rains, thousands of streams like this, rush down this and other mountains, each more or less colored by the sand and earth it washes from among the rocks. The little streams run into the brooks, the brooks into the river, and all are busy carrying away the substance of the mountains. Is it any wonder that they are wearing out?"

It will take ever and ever so long to wear them quite small, won't it?"

"What makes you say so?"

"They are so large and the rocks are so hard."

"True it will take more years than you will ever be able to number."

"I'm glad of that," said Johnny, hopefully.

"Why?"

"Because"—and the little fellow looked over the sea of mountains with the air of a great explorer—"because I am going to climb them all when I'm a man, and I want them to be big."—*Christian Union.*

NORMAL SCHOOL INSTRUCTION.

The *Atlantic Monthly* for October has an article on the new Prussian scheme for common school education, in which it gives particular attention to the part devoted to normal training of teachers. The Prussian normal school of forty years ago gave only purely theoretical instruction, leaving untouched the great field of practical, experimental knowledge. This continued for twenty years, until the popular feeling against normal schools became so strong that they were reorganized on an entirely different plan, this time entirely rejecting the theoretical and allowing only the practical. Learning by rote was largely substituted for the formal exercise of the understanding, and instead of knowledge the object proposed to the student was the acquisition of the technical facilities which the children were to learn from him. Such a drill as this necessarily produced a weak, inefficient teacher, with too little culture and knowledge. He no doubt excelled in technical skill, within his narrow range, but had no power of giving a broad and generous education. This reform, like the other, was too extreme, but from these two experiences the Prussians have learned wisdom, and in the new regulations have happily combined theory and practice.

"Every normal school is to have organically connected with it two practice schools, one graded and the other ungraded. The course of instruction continues three years, the pupils of each year constituting a class. It is the object of the lowest class to bring under uniform training and work students whose previous preparation has been indifferent. They are to be taught to arrange and supplement their knowledge, and to re-

produce it independently. In this grade the students have no connection with the practice schools. In the second class the students receive such extension of their knowledge as they will require in their subsequent work as teachers. In the practice schools, they listen to the exercises of the teachers, in which, at intervals, they render assistance, and make trials independently in teaching. In the first class, where the course is concluded, the pupils are specially instructed with reference to their future self-culture. Besides, they undertake, under the same guidance and oversight of the principals and instructors of the practice schools, continuous instruction in the same. In this practice they are to be occupied not less than six nor more than ten hours a week, and the programme must be so arranged that no pupil will leave the training seminary without having had an opportunity to practice the teaching of all the essential branches prescribed for the common schools. In the Prussian seminaries for teachers the practicing school is the point round which the whole instruction turns. And herein they are vastly superior to our American normal schools, which are rarely provided with any practicing school at all. Hence our normal schools are too theoretical. Like the Prussian normal schools of forty years ago, they are aiming too exclusively at general culture, and not enough at practical skill. They send out pupils largely imbued with good principles, but lamentably deficient in the technical skill they need in the school-room."

In addition to professional instruction, like the different branches of "pedagogy," other required subjects of instruction are: religion, German, history, arithmetic, geometry, algebra, natural history, physics, chemistry, geography, drawing, writing, gymnastics, music, French, English or Latin, gardening, and silk culture. No one can teach in Prussia who has not satisfactorily passed the course in a normal school.

"This scheme of normal training is preceded by a detailed statement of the qualifications requisite for admission to the normal seminary, with specific directions as to the examination of candidates, and followed by the revised regulations respecting the examination of teachers for the different grades of common schools. All educational interests center in the teacher, and the test of every system of education is found in its provisions for securing competent teachers. Here is the

weak point in the systems in our several States. Nowhere is there anything like adequate provision for either educating professionally a supply of teachers, or for duly testing their qualifications. In this general lack of the necessary means of securing skillful teachers, is found the chief cause of the unsatisfactory results of our schools, especially those outside the cities and larger villages. In our efforts to supply this deficiency we shall do well to avail ourselves of the results of the experience of that country which has always been foremost in this matter, and especially of the results embodied in this new scheme."

Every word of this is true in its application to the normal schools of the United States. Comparatively few of our normal schools have any practicing departments at all, and *not one* that we know of has any unclassified department. As not ono of our schools in ten can be graded, the amount of practice that our normal schools give to purely common school work is ridiculously small But of normal instruction in some of its other phases, we will make mention at another time.

THE *Baltimore Gazette* says, in relation to a new text-book for beginners, an "Introduction to English Grammar:" "We utterly protest against 'introducing' young children to English grammar, for we are convinced that it is worse than useless—it is hurtful. Grammar is the most metaphysical study of the school course. It is abstract and abstruse, and difficult for even mature minds to grasp. * * * When a child speaks good English, it is only because he has been accustomed to hear good English spoken. When he makes an error, it is well to tell him that he is wrong, and tell him what is right; but to attempt to give him an abstract law of language, so as to keep him from making similar mistakes in future, is simply hopeless. * * * There can be little doubt that it injures the mind of a child to force him to study what he cannot understand. The learning of things by rote hurts the intellect. It teaches it to rely upon the memory instead of the understanding. It breeds a slavish habit of mind, which accepts things because 'they are in the book,' instead of thinking on them. It fosters the indolent tendency to pass over things without an effort to understand; and all these the study of grammar fastens upon the young buds of intellect. Sixteen years old is young enough to begin the study."

DEPARTMENT OF PUBLIC INSTRUCTION.

SCHOOL OFFICERS will please bear in mind that the time for holding the annual school meeting for the election of trustees has been changed by the last Legislature, from the last Saturday in April to the last Saturday in June.

AT the last meeting of the State Board of Education, the "Advanced Grade" was expunged from the Course of Studies. It will, therefore, be the duty of Boards of Trustees and of Education to prescribe, or authorize the teacher to prescribe a course of studies for the scholars who have completed the studies of the First Grade. The old course may be retained in whole or in part, or a totally different course may be prescribed.

OFFICE OF CONTROLLER OF STATE,
Sacramento, California, February 23d, 1875.

Hon. H. N. BOLANDER, *Superintendent of Public Instruction:*

SIR: In accordance with an Act of the Legislature, I have the honor to report as follows:

The securities belonging to the School Fund, held in trust by the State Treasurer, consist of bonds of the State of California, bearing interest at legal rates, and amount to one million six hundred and twelve thousand five hundred dollars ($1,612,500).

The money in the State Treasury, subject to apportionment, and the sources from which it was derived, is as follows:

Interest on school lands	$48,889 97
Interest on bonds held in trust	50,130 00
Property tax (five cents and two mills on each one hundred dollars)	1,009,470 42
Subject to apportionment	$1,108,490 39

Very respectfully,

JAMES J. GREEN, Controller.

APPORTIONMENT.

Total number of census children between five and seventeen years of age entitled to receive school money, 159,717. Amount per child, $6 96.

ALAMEDA COUNTY.—Alameda, 498; Alvarado, 132; Alviso, 97; Bay, 60; Castro Valley, 61; Centreville, 120; Cosmopolitan, 85; Eden Vale, 61; Eureka, 141; Fruit Vale, 103; Inman, 63; Laurel, 328; Lincoln, 34; Livermore, 220; Lockwood, 92; May, 93; Mission San José, 123; Mountain House, 37; Moury's Landing, 56; Murray, 60; Oakland, 3,952; Ocean View, 116; Palomares, 59; Peralta, 168; Pleasanton, 150; Redwood, 44; San Lorenzo, 191; Stony Brook, 20; Suñol, 63; Summit, 44; Temescal, 157; Townsend, 84; Union, 423; Valle-

cito, 57; Washington, 132; Warm Springs, 87; Midway, 9. Total, 8,220; amount, $57,046 80.

ALPINE COUNTY.—Clay, 15; Everett, 21; Franklin, 17; Lincoln, 23; Webster, 21. Total, 97; amount, $673 18.

AMADOR COUNTY.—Amador City, 159; Aqueduct City, 31; Buena Vista, 47; Clinton, 39; Drytown, 75; Fiddletown, 116; Franklin, 31; Forest Home, 66; Julian, 49; Ione Valley, 112; Jackson, 206; Jackson Valley, 34; Lancha Plana, 53; Mountain Echo, 26; Mountain Springs, 21; Milligan's, 43; New York Ranch, 29; Oneida, 96; Plymouth, 154; Pine Grove, 49; Sutter Creek, 360; Stony Creek, 21; Union, 57; Upper Rancheria, 41; Volcano, 188; Williams, 46; Willow Springs, 53; Washington, 75; Buckeye Valley, 20. Total, 2,297: amount, $15,941 18.

BUTTE COUNTY.—Antelope, 32; Bangor, 53; Bidwell, 28; Butte Valley, 54; Butte, 46; Cañon Creek, 37; Centerville, 29; Central House, 33; Chico, 620; Cherokee, 179; Cottonwood, 42; Dayton, 85; Delaplain, 60; Eureka, 30; Evansville, 24; Fairview, 19; Franklin, 12; Forbestown, 67; Gridley, 52; Hamilton, 146; Inskip, 13; Kimshew, 45; Live Oak, 23; Lone Tree, 56; Lovelock, 32; Little Chico, 62; Manzanita, 30; Meridian, 82; Mesilla Valley, 43; Morris' Ravine, 26; Mountain Spring, 35; Mud Creek, 35; Mooretown, 33; Meadow, 30; Ninshew, 18; Nelson, 48; Oroville, 290; Oregon City, 54; Pine Creek, 56; Rio Seco, 46; Rock Creek, 50; Salem, 29; Stoneman, 37; Union, 30; Upham, 32; Webster, 39; West Liberty, 43; Wyandotte, 84; Wyman's Ravine, 33; York, 20; Clipper Mills, 24. Total, 3,126; amount, $21,694 44.

CALAVERAS COUNTY.—Angels, 223; Altaville, 120; Brushville, 21; Camanche, 115; Copperopolis, 117; Chili Gulch, 49; Cave City, 51; Calaveritas, 59; Campo Seco, 66; Douglas Flat, 55; Eureka, 72; Fourth Crossing, 70; Jenny Lind, 76; Mokelumne Hill, 218; Murphys, 133; Mosquito Gulch, 19; Milton, 43; Negro Gulch, 41; Pleasant Springs, 16; Petersburg, 90; Paloma, 70; Robinson's Ferry, 21; San Andreas, 175; Sheep Ranch, 42; Spring Valley, 37; Salt Spring Valley, 38; Telegraph City, 35; Vallecito, 97; Washington Ranch, 31; West Point, 79; Black Hills, 21. Total, 2,300; amount, $15,962 00.

COLUSA COUNTY.—Antelope, 34; Ashton, 36; Butte Creek, 18; Black Butte, 43; Bridgeport, 53; Bear Valley, 27; Cortina, 33; Central, 26; Colusa, 327; Cherokee, 40; Dry Slough, 60; Excelsior, 20; Emigrant, 50; Franklin, 72; Freshwater, 74; Fairview, 38; Grand Island, 71; Grindstone, 31; Independent, 35; Indian Valley, 51; Jacinto, 70; Jefferson, 18; Johns, 53; Jackson, 67; Kanawha, 24; Lake, 32; Liberty, 32; Marion, 22; Mountain, 26; Montgomery; 34; Newville, 58; Newland, 36; Plaza, 56; Princeton, 69; Pleasant View, 21, Prairie, 16; Quicksilver, 23; Union, 82; Webster, 25; Washington, 52; Willow, 53; White Bank, 23; Stony Creek, 10. Total, 2,041; amount, $14,164 54.

CONTRA COSTA COUNTY.—Alamo, 61; Amador, 13; Antioch, 178; Alhambra, 45; Bay Point, 65; Browe's Valley, 51; Carbondale, 224; Central, 39; Concord, 104; Danville, 47; Deer Valley, 32; Excelsior, 103; Eden Plain, 55; Green Valley, 52; Iron House, 53; Lafayette, 58; Liberty, 63; Lime Quarry, 60; Lone Tree, 46; Martinez, 171; Moraga, 52; Morgan Territory, 40; Mt. Diablo, 120; Mt. Pleasant; 74; Oak Grove, 45; Pinole, 78; Pleasant Hill, 48, Pacheco, 156; Rodeo Valley, 32; San Ramon, 69; San Pablo, 319; Somersville, 131; Syeamore, 48; Tassajara, 64; Willow Springs, 55. Total, 2,851; amount; $19,785 94.

DEL NORTE COUNTY.—Crescent, 216; Bradford, 60; Happy Camp, 37; Rowdy Creek, 25; Redwood, 16; Ocean, 27; Fort Dick, 20; Lincoln, 18. Total, 419; amount, $2,907 86.

EL DORADO COUNTY.—Buckeye, 62; Blair's, 64; Bear Creek, 28; Carson Creek, 17; Cold Springs, 37; Coloma, 151; Coon Hollow, 86; Diamond Springs, 64; El Dorado, 106; French Creek, 44; Garden Valley, 45; Greenwood, 70; Georgetown, 164; Green Valley, 38; Gold Hill, 56; Indian Diggings, 30; Jay Hawk, 61; Kelsey, 79; Lake Valley, 31; Latrobe, 79; Missouri Flat, 22; Mountain, 46; Mount Aukum, 68; Mosquito, 18; Nashville, 18; Newton, 16; Oak Hill, 53; Pilot Hill, 30; Placerville, 376; Pleasant Valley, 89; Salmon Falls, 43; Spanish Dry Diggings, 25; Tennessee, 48; Union, 102; Uniontown, 55;

United, 63; Cave Valley, 16; Natoma, 33; Wild Goose, 15. Total, 2,448; amount, $16,989 12.

FRESNO COUNTY.—Areola, 44; Centerville, 28; Chowchilla, 39; Clark's Valley, 30; Dalton, 34; Dry Creek, 56; Fair View, 34; Fancher, 33; Fresno, 64; Fresno City, 55; Fort Washington, 24; Hazelton, 21; Kingston, 82; Lake, 39; Millerton, 80; New Idria, 106; Panoche, 108; Pleasant Vale, 56; Pleasant Valley, 51; Round Mountain, 21; San Joaquin, 38; Scottsburg, 40; Squaw Valley, 40; Washington, 23. Total, 1,146; amount, $7,953 24.

HUMBOLDT COUNTY.—Mad River, 71; Janes, 62; Bay, 38; Union, 234; Eureka, 506; Peninsula, 27; Elk River, 54; Bucksport, 50; Salmon Creek, 46; Table Bluff, 69; Pacific, 30; Slide, 60; Rohnerville, 142; Hydesville, 122; Yager Creek, 34; Laribee, 48; South Fork, 127; McDiarmid's Prairie, 19; Van Duzen, 33; Grizzly Bluff, 71; Island, 41; Grant, 41; Ferndale, 121; Centerville, 40; Bear River, 36; Mattole, 118; Upper Mattole, 71; Cuddlebaek, 18; Eagle Prairie, 25; Worthington's Prairie, 22; Fresh Water, 26. Total, 2,402; amount, $16,669 88.

INYO COUNTY.—Bishop Creek, 53; Big Pine, 30; Independence, 39; Irving, 17; Lone Pine, 83; Milton, 31; Round Valley, 28; Union, 38. Total, 319; amount, $2,213 86.

KERN COUNTY.—Cumming's Valley, 66; Fitzgerald, 39; Havilah, 15; Kern Island, 294; Kernville, 62; Linn's Valley, 121; Tehachipa, 94; Weldon, 31; Wicker, 37. Total, 759; amount, $5,267 46.

KLAMATH COUNTY.—Klamath, 80; ——, 71; ——, 59; ——, 29; ——, 52. Total, 291; amount, $2,019 54.

LAKE COUNTY.—Morgan Valley, 22; Lower Lake, 104; Burns' Valley, 33; Excelsior, 24; Loeonomi, 62; Rineon, 47; Uncle Sam, 81; Kelsey Creek, 51; Big Valley, 32; Pleasant Grove, 60; Upper Lake, 169; Bachelor Valley, 68; Blue Lake, 30; Cobb Valley 27; Middletown, 140; Spruce Grove, 29; Ashland, 35; Gravelly Valley, 19; Mountain, 28; Scott's Valley, 37; Lakeport, 116. Total, 1,214; amount, $8,425 16.

LASSEN COUNTY.—Susanville, 186; Susan River, 59; Janesville, 44; Lake, 52; Milford, 47; Long Valley, 28; Soldier's Bridge, 27; Willow Creek, 45; Providence, 91; Pleasant Butte, 50; Washington, 34. Total, 663; amount, $4,601 22.

LOS ANGELES COUNTY.—Alameda, 118; Anaheim, 255; Azusa, 145; Ballona, 179; Bolsa Grande, 40; Bog Dale, 70; Calmenga, 70; Cienega, 131; Duarte, 65; El Monte, 145; Elizabeth Lake, 50; Fair View, 51; Florence, 40; Green Meadows, 93; La Puenta, 104; La Dow, 92; Los Angeles, 2,411; Little Lake, 41; Los Nictos, 146; Maizeland, 72; New River, 80; New Port, 97; Old Mission, 145; Orangethorpe, 30; Palomares, 224; Richland, 145; Ranchito, 79; Rowland, 117; Santa Ana, 216; San Antonio, 95; San Fernando, 149; San Gabriel, 241; San Juan, 171; San José, 117; San Pedro, 176; Silver, 147; Soledad, 50; Spring, 101; Syeamore, 37; Vernon, 119; Westminster, 61; Wilmington, 157; San Dimas, 52. Total, 7,124; amount, $49,440 56.

MARIN COUNTY.—American Valley, 24; Aurora, 60; Bolinas, 33; Bay, 76; Chileno Valley, 50; Clark, 55; Dixie, 259; Estero, 34; Franklin, 22; Gareia, 51; Halleck, 28; Laguna, 25; Lincoln, 15; Nicacio, 79; Novato, 52; Olema, 22; Point Reyes, 42; Ross Landing, 68; Richardson, 63; San Rafael, 347; Saucelito, 55; San Quentin, 43; San Antonio, 38; San Jeronimo, 20; Tomales, 75. Total, 1,636; amount, $11,353 84.

MARIPOSA COUNTY.—Mariposa, 118; Hornitos, 140; Bear Valley, 77; Coulterville, 85; Granite Springs, 30; Quartzburg, 50; Elkhorn, 43; Carthay's Valley, 62; Princeton, 31; Pea Ridge, 60; Sherlock's, 30; Yosemite, 69; Sebastopol, 77; Merced Falls, 18. Total, 890; amount, $6,176 60.

MENDOCINO COUNTY.—Anderson, 90; Albion, 15; Big River, 84; Bridgeport, 50; Buchanan, 135; Big Rock, 24; Cahto, 45; Calpella, 22; Caspar, 36; Central 67; Counts, 39; Coyote, 32; Cuffey's Cove, 40; Eel River, 60; Fish Rock, 45; Farley, 72; Gaskill, 42; Gualala, 33; Galloway, 40; Indian Creek, 34; Little Lake, 51; Little River, 30; Lima, 19; Long Valley, 48; Manchester, 126; Mill

Creek, 59; Navarro, 37; Noyo, 19; Ocean, 24; Oriental, 70; Potter Valley, 50; Prairie Camp, 34; Rancheria, 70; Redwood, 51; Round Valley, 125; Sanel, 96; Sherwood, 62; Ten Mile River, 62; Ukiah, 370; Union, 60; Upper Little Lake, 78; Walker Valley, 30; Willitsville, 72. Total, 2,648; amount, $18,377 12.

MERCED COUNTY.—Anderson, 50; Bear Creek, 27; Clay, 57; Eden, 21; Fair View, 32; Hopeton, 36; Jefferson, 59; Lone Tree, 46; Los Baños, 95; Madison, 32; Munroe, 52; Mariposa, 74; McSwain, 38; Merced, 248; Pioneer, 32; Plainsburg, 60; Snelling, 86; Washington, 43; San Louis, 67; Merced Falls, 27. Total, 1,182; amount, $8,203 08.

MODOC COUNTY.—Adin, 86; Arlington, 36; Ash Creek, 20; Big Valley, 32; Cedarville, 52; Centreville, 107; Deep Creek, 78; Dorrisville, 36; Doten, 20; Eagleville, 50; Fall River, 5; Goose Lake, 48; Lake City, 80; Lassen, 24; Mount Bidwell, 30; Nevada, 49; Oregon, 49; Overton, 18; Pitt River, 28; Riceland, 18; Round Valley, 48; Stone Coal, 22; Surprise Valley, 32. Total, 968; amount, $6,717 92.

MONO COUNTY.—Antelope, 29; North Antelope, 15; Benton, 24; Bridgeport, 36. Total, 104; amount, $721 76.

MONTEREY COUNTY.—Alisal, 71; Bernabe, 61; Carmelo, 102; Carrolton, 82; Castroville, 257; El Sansal, 28; Gonzalez, 103; Jacks, 24; Lindley, 102; Monterey, 345; Mountain, 80; Natividad, 118; Oak Grove, 75; Rincon, 55; Red Rock, 75; Salinas City, 388; San Antonio, 114; San Miguel, 55; Santa Rita, 137; Soledad, 106; Spring, 32; Springfield, 44; Sycamore Spring, 58; Washington, 126; Carneros, 63; Long Valley, 77; Peach Tree, 30; Priest Valley, 20; Shearer, 33. Total, 2,861; amount, $19,855 34.

NAPA COUNTY.—Buchanan, 115; Berryessa, 50; Bennett, 62; Carneros, 53; Calistoga, 161; Chiles, 56; Cherry Valley, 23; Cappelle Valley, 27; Chiles Valley, 22; Conn Valley, 22; Cinnabar, 72; Franklin, 17; Foss Valley, 19; Gorton Valley, 28; Howard, 37; Harmony, 61; Jefferson, 40; Liberty, 56; Lodi, 44; Napa City, 756; Oakville, 29; Oak Grove, 28; Pope Valley, 57; Putah, 33; Redwood, 86; Suscol, 39; St. Helena, 265; Soda Cañon, 31; Salvador, 36; Sulphur Springs, 36; Spring Mountain, 32; Tucker, 33; Upper Popo Valley, 38; Vineland, 66; Wooden Valley, 30; Yount, 30; Mountain, 9. Total, 2,599; amount, $18,037 06.

NEVADA COUNTY.—Allison Ranch, 188; Boca, 24; Birchville, 65; Bluo Tent, 32; Bear River, 26; Chalk Bluff, 49; Clear Creek, 60; Cherokee, 69; Columbia Hill, 74; Eureka, 93; Forest Springs, 132; French Corral, 87; Grass Valley, 952; Graniteville, 20; Greeley, 22; Indian Springs, 70; Kentucky Flat, 86; Little York, 50; Limo Kiln, 25; Liberty Hill, 32; Lake City, 41; Moore's Flat, 89; Mooney Flat, 62; Nevada, 795; North San Juan, 169; North Bloomfield, 123; North Star, 127; Oakland, 117; Onega, 50; Pleasant Valley, 44; Quaker Hill, 31; Rough and Ready, 87; Relief Hill, 29; Sebastopol, 53; Spencerville, 36; Sweetland, 86; Truckee, 209; Union Hill, 130; Washington, 45; Willow Valley, 53. Total, 4,532; amount, $31,452 08.

PLACER COUNTY.—Auburn, 220; Alta, 41; Bath, 42; Blue Cañon, 25; Central, 30; Christian Valley, 39; Coon Creek, 28; Colfax, 156; Dane Town, 27; Deadwood, 12; Duch Flat, 203; Damascus, 24; Emigrant Gap, 17; Excelsior, 20; Franklin, 30; Forest Hill, 159; Gold Hill, 29; Gold Run, 96; Iowa Hill, 101; Last Chance,—; Lisbon, 35; Lincoln, 59; Lone Star, 26; Michigan Bluff, 61; Mount Pleasant, 41; Neilsburg, 37; Newcastle, 54; Norwich, 47; Ophir, 131; Penryn, 51; Pleasant Grove, 19; Rock Creek, 51; Rocklin, 128; Roseville, 72; Smithville, 25; Spring Garden, 31; Todd's Valley, 34; Valley View, 25; Wisconsin Hill, 37; Washington, 29; Yankee Jims, 34; Dry Creek, 20; Fair View, 12; Rattlesnake, 42; Union, 26. Total, 2,426; amount, $16,836 44.

PLUMAS COUNTY.—Beckworth, 33; Big Meadows, 13; Butterfly Valley, 20; Crescent 66; Clover Valley, 16; Greenville, 74; Hot Spring, 28; Island, 21; Lincoln, 23; La Porte, 119; Lassen Buttes, 17; Mohawk, 24; Pioneer, 30; Pilot Peak, 14; Quincy, 86; Summit, 23; Sulphur Spring, 21; Seneca, 10; Spanish Peak, 41; Taylor, 74; Union, 18; Antelope, 14; Rocky Point, 7. Total, 792; amount, $5,496 48.

SACRAMENTO COUNTY.—Alabama, 57; American, 16; American River, 98; Antelope, 15; Ashland, 27; Brannan, 31; Brighton, 30; Buckeye, 31; Carson Creek, 42; Davis, 19; Dry Creek, 15; Elder Creek, 52; Elk Grove, 62; Enterprise, 73; Excelsior, 51; Franklin, 59; Freeport, 46; Galt, 58; Georgiana, 40; Granite, 135; Grant, 31; Hicksville, 37; Homewood, 13; Jackson, 31; Katesville, 27; Kinney, 84; Laguna, 8; Lee, 16; Lincoln, 30; Lisbon, 35; Michigan Bar, 79; Mokelumne, 33; Oak Grove, 26; Obisbo, 56; Pacific, 30; Pleasant Grove, 84; Point Pleasant, 37; Prairie, 35; Rhoades, 24; Richland, 33; San Joaquin, 67; Sherman, 45; Stone House, 29; Sutter, 88; Sylvan, 77; Sacramento, 3,755; Union, 30; Viola, 44; Washington, 71; Walnut Grove, 31; White Rock, 41; Wilson, 33; West Union, 35; Emmaton, 17; Center, 24; Hutson, 12; Natoma, 19. Total, 6,124; amount, $42,500 56.

SAN BENITO COUNTY.—Hollister, 325; Bear Valley, 30; Jefferson, 96; San Juan, 251; Gabilan, 25; San Benito, 76; Live Oak, 50; Pacheco, 62; Erie, 47; Santa Ana, 79; Tres Pinos, 142; Lone Tree, 38; Fair View, 55; Union, 25; San Felipe, 9; Priest Valley, 8; Peach Tree, 21. Total, 1,339; amount, $9,292 66.

SAN BERNARDINO COUNTY.—Ameriean, 55; Central, 52; Chino, 156; City, 350; City Creek, 51; Cram, 35; Cucamungo, 55; Jarupa, 44; Juapa, 39; Mill, 55; Mission, 114; Mount Vernon, 164; New Chino, 39; Riley, 90; Riverside, 81; San Salvador, 175; San Timeteo, 91; Temescal, 42; Warm Spring, 83; Washington, 54. Total, 1,825; amount, $12,665 50.

SAN DIEGO COUNTY.—Ballena, 45; Banner, 32; Bear Valley, 72; Cajou, 59; East San Diego, 89; Hope, 28; Jumal, 28; Julian, 87; Milquatay, 18; Monserrate, 35; Mount Fair View, 57; National, 22; New San Diego, 457; Poway, 41; Potrero, 57; San Diego, 278; San Jacinto, 58; San Luis Rey, 96; San Dieguita, 17; Temecula, 92; Monument, 30. Total, 1,728; amount, $11,992 32.

SAN FRANCISCO COUNTY.—Total, 38,093; amount, $264,365 42.

SAN JOAQUIN COUNTY.—August, 49; Athearn, 66; Alpine, 30; Brunswick, 53; Burwood, 36; Bellota, 67; Calaveras, 33; Corral Hollow, 23; Castle, 33; Chartville, 34; Charity Dale, 16; Columbia, 42; Davis, 52; Douglas, 33; Dry Creek, 24; Delphi, 71; Duck Lake, 15; Elliott, 46; Elkhorn, 32; Everett, 47; Enterprise, 17; French Camp, 46; Franklin, 37; Fairview, 19; Greenwood, 46; Grant, 53; Henderson, 53; Harmony Grove, 58; Houston, 94; Jefferson, 44; Lindcn, 138; Liberty, 52; Live Oak, 30; Lincoln, 26; Lone Tree, 17; Lafayette, 37; Lockford, 98; Moore, 36; Madison, 52; Montezuma, 31; Mokelumne, 16; Mount Carmel, 41; McKarney, 51; New Jerusalem, 50; New Hope, 30; North, 48; Pacific, 22; Rustic, 24; River, 27; Stockton, 1,966; South, 30; Salem, 101; Shady Grove, 36; San Joaquin, 24; Telegraph, 58; Tulare, 59; Turner, 50; Union, 57; Valley, 98; Van Allen, 60; Woods, 77; Wheatland, 27; Washington, 43; Wildwood, 63; Weber, 40; Willow, 70; Zine House, 61; Central, 8; Home, 23; Hutson, 9; Rising Sun, 14; Midway, 16. Total, 5,085; amount, $35,289 90.

SAN LUIS OBISPO COUNTY.—Arroyo Grande, 165; Central, 45; Excelsior, 62; Estrella, 37; Estero, 26; Franklin, 45; Hesperian, 78; Hope, 57; Home, 54; Josephine, 54; Los Osos, 36; Los Tablos, 46; Mission, 431; Mammoth Rock, 28; Olmstead, 54; Oso Flaco, 48; Santa Fé, 188; Santa Rosa, 42; San José, 118; San Miguel, 26; Salinas, 51; San Simeon, 45; Summit, 57; Washington, 50. Total, 1,843; amount, $12,790 42.

SAN MATEO COUNTY.—Alpine, 36; La Honda, 23; Belmont, 48; Geersberg, 56; Halfmoon Bay, 359; Jefferson, 78; Laguna, 81; Millbrae, 38; New Bell, 32; Pescadero, 71; Pharis, 20; Pigeon Point, 42; Pompania, 18; Purissima, 105; Redwood City, 546; San Bruno, 81; San Gregorio, 24; San Mateo, 201; San Pedro, 59; San Reymundo, 18; Searsville, 94; Seaside, 23; Tunis, 44; West Union, 18. Total, 2,115; amount, $14,678 10.

SANTA BARBARA COUNTY.—Santa Barbara, 959; Montecito, 152; Carpenteria, 72; Rafaela, 180; Graciosa, 100; Hope, 96; Pine Grove, 74; Guadalupe, 83; Ocean, 29; Rincon, 32; Laguna, 47; Santa Maria, 94. Total, 1,918; amount, $13,310 92.

SANTA CLARA COUNTY.—Adams, 81; Alviso, 152; Berryessa, 67; Braly, 61; Burnett, 47; Calaveras, 27; Cambrian, 65; Carneadero, 59; Collins, 44; Eagle,

59; Eneinal, 38; Evergreen, 104; Franklin, 49; Gilroy, 486; Guadalupe, 83; Hacienda, 99; Hamilton, 76; Hester, 351; Highland, 58; Hill, 297; Jackson, 70; Jefferson, 90; Laguna, 32; Lexington, 41; Live Oak, 65; Llagas, 72; Los Gatos, 84; Lincoln, 57; Mayfield, 269; Millikin, 52; Milpitas, 127; Mooreland, 67; Mountain View, 146; Mount Pleasant, 34; Midway, 47; Oak Grove, 92; Orchard Street, 130; Pala, 105; Pioneer, 87; Rhodes, 64; Saratoga, 119; San Antonio, 46; Santa Clara, 547; San José, 2,493; San Ysidro, 134; Sierra, 33; Silver Creek, 40; Union, 61; Whisman, 65; Willow Glen, 107; San Felipe, 33; Summit, 21. Total, 7,724; amount, $53,604 56.

SANTA CRUZ COUNTY.—Santa Cruz, 866; Pajaro, 652; San Andreas, 68; Mountain, 42; Corralitos, 153; Petroleum, 20; Happy Valley, 57; Hazel Brook, 18; El Jarro, 44; Railroad, 34; Scott's Valley, 33; San Lorenzo, 65; Bay View, 116; Green Valley, 63; Carlton, 52; Soquel, 219; Union, 57; Aptos, 73; Roache, 91; Vine Hill, 29; Aqua Puerca, 16; Hill, 16; Casserly, 51; San Vicente, 29; Live Oak, 50; Boulder Creek, 44; Davenport, 15; Summit, 35. Total, 3,008; amount, $20,875 52.

SHASTA COUNTY.—American Ranch, 22; Bald Hill, 45; Buckeye, 40; Burney Valley, 41; Cañon House, 101; Centreville, 62; Clover Creek, 63; Cottonwood, 37; Cow Creek, 60; Eagle Creek, 52; Fall River, 57; French Gulch, 71; Klotz's Mill, 58; Millville, 116; Oak Knoll, 27; Parkville, 47; Piety Hill, 50; Pitt River, 62; Round Mountain, 59; Sacramento River, 37; Shasta, 226; Sheldon, 19; Sierra, 43; Stillwater, 40; Whisky Creek, 38. Total, 1,473; amount, $10,222 62.

SIERRA COUNTY.—Alleghany, 62; Alpine, 26; Alta, 23; Antelope, 21; Butte, 52; Downieville, 190; Eureka, 36; Forest, 68; Gibsonville, 33; Goodyear, 48; Loyalton, 76; Minnesota, 16; Morristown, 10; Mount Pleasant, 30; Newark, 30; Plum Valley, 33; Poker Flat, 19; Rocky Point, 41; Sierraville, 102; St. Louis, 38; Table Rock, 54; Union, 57; Washington, 26. Total, 1,091; amount, $7,571 54.

SISKIYOU COUNTY.—Berryvale, 19; Bogus, 30; Butteville, 41; Callahan's, 35; Cedar Park, 35; Cottonwood, 39; Douglas, 44; East Fork, 19; Etna, 67; Franklin, 34; Hamburg Bar, 16; Hawkinsville, 34; Hooper, 28; Humbug, 14; Klamath, 18; Lincoln, 48; Little Shasta, 80; Meamber, 37; Moffit Creek, 18; Mount Shasta, 21; Oro Fino, 38; Quartz Valley, 23; Scott River, 51; Scott Valley, 115; Shasta Valley, 15; Sciad Valley, 16; South Fork, 24; Table Rock, 46; Union, 17; Vineland, 24; Washington, 64; Willow Creek, 51; Yreka, 436. Total, 1,597; amount, $11,083 18.

SOLANO COUNTY.—Alamo, 48; American Cañon, 32; Benicia, 481; Binghampton, 67; Bunker Hill, 97; Crystal, 249; Center, 57; Collinsville, 25; Dover, 28; Denverton, 16; Dixon, 182; Egbert, 42; Esmeralda, 26; Enterprise, 13; Fairfield, 105; Grant, 73; Green Valley, 71; Gomer, 24; King, 38; Maine Prairie, 41; Montezuma, 33; Oak Dale, 36; Owens, 42; Pitts, 67; Pleasant Valley, 32; Peaceful Glen, 20; Rio Vista, 135; Rockville, 56; Round Hill, 45; Salem, 32; Silveyville, 106; Solano, 57; Suisun, 60; Fremont, 56; Ulatus, 148; Union, 69; Vallejo, 1,578; Wolfskill, 30; Canright, 26; Peña, 27; Morning Light, 22; Mountain, 21; Putah, 17. Total, 4,430; amount, $30,744 20.

SONOMA COUNTY.—Alexander, 37; Alpine, 35; American Valley, 26; Bloomfield, 114; Bodega, 51; Burns, 28; Burnside, 46; Canfield, 15; Cinnabar, 56; Cloverdale, 224; Coleman Valley, 45; Copeland, 35; Court House, 691; Dry Creek, 37; Dunbar, 54; Durham, 46; Eagle, 19; Enterprise, 41; Fisk's Mill, 47; Freestone, 68; Geyserville, 70; Grape, 39; Green Valley, 53; Gilford, 59; Guillicos, 17; Hall, 51; Hamilton, 62; Harvey, 75; Healdsburg, 401; Hearn, 20; Hill, 58; Independence, 39; Iowa, 42; Junction, 31; Knight's Valley, 43; Laguna, 102; La Fayette, 47; Lake, 25; Lakeville, 46; Lewis, 47; Liberty, 49; Lone Redwood, 31; Laurel Grove, 25; Manzanita, 43; Mark West, 66; Marin, 42; Mayaccama, 28; Mendocino, 65; Mill Creek, 53; Miriam, 160; Monroe, 25; Mountain, 19; Mount Vernon, 27; Oak Grove, 63; Occidental, 44; Oriental, 50; Pacific, 16; Payran, 98; Petaluma, 872; Piner, 53; Pleasant Hill, 20; Potter, 117; Redwood, 98; Rincon, 30; Russian River, 29; San Antonio, 59; Santa Rosa, 28; Scotta, 74; Sonoma, 283; Sotoyome, 59; Starr, 37; Spring Hill, 43; Steuben, 39; Stewart's Point, 67; Stony Point, 21; Strawberry, 43; Tarwater, 56; Todd, 38; Table Mountain, 21; Walker, 34; Wallace, 29; Wa-

lula, 88; Washington, 41; Watmaugh, 33; Waugh, 37; Wilson, 72; Watson, 27; Wright, 29; Windsor, 103. Total, 6,526; amount, $45,290 44.

STANISLAUS COUNTY.—Adamsville, 65; Bachelor Valley, 50; Belpassi, 50; Booth, 22; Bonita, 42; Branch, 106; Burnett, 17; Buena Vista, 41; Cole, 32; Dry Creek, 12; Davis, 57; Empire, 23; Emery, 79; Farm Cottage, 32; Fairview, 62; Grant, 36; Garner, 31; Grayson, 39; Haight, 34; Hill's Ferry, 35; Hoar's Ranch, 18; Jackson, 54; Jefferson, 38; Jones, 58; Junction, 51; Marksville, 20; McHenry, 33; Modesto, 236; Oak Dale, 65; Oristimba, 50; Paradise, 25; Union, 18; Rhinehart, 29; Rowe, 35; Tuolumne, 45; Washington, 55; White Crow, 25; White Oak, 41; Black Hills, 26; Home Union, 16; Rising Sun, 32. Total, 1,835; amount, $12,734 90.

SUTTER COUNTY.—Auburn, 47; Barry, 42; Bear River, 26; Brown's, 58; Brittan's, 41; Buttesylvania, 22; Central, 60; Columbia, 58; Eagle, 37; Franklin, 21; Gaither, 55; Grant, 44; Illinois, 31; Knight's, 33; Jefferson, 30; Lee, 23; Lincoln, 45; Live Oak, 28; Marcum, 35; Meridian, 57; Myers, 28; Nicolaus, 60; North Butte, 38; Noyes, 23; Prairie, 16; Rome, 36; Salem, 18; Slough, 42; Sutter, 32; Union, 25; Vernon, 27; Washington, 45; West Butte, 36; Winship, 39; Willow Pond, 35; Yuba, 160; Fair View, 25. Total, 1,478; amount, $10,257 32.

TEHAMA COUNTY.—Red Bluff, 434; Tehama, 142; Coast Range, 30; Paskenta, 35; Lassen, 54: Antelope, 71; Floyd, 33; Cottonwood, 45; Sierra, 84; Stony Creek, 29; Oat Creek, 21; Montgomery, 23; Orion, 43; Toomes, 22; Hunter's, 48; Washington, 46; Elder Creek, 15; Reed's Creek, 37; Red Bank, 64; Elkins, 39; Moon's, 18; Live Oak, 26; Lowery, 22. Total, 1,381; amount, $9,584 14.

TRINITY COUNTY.—Weaverville, 194; Hay Fork, 87; Lewiston, 69; Douglas City, 65; Junction City, 59; North Fork, 51; Trinity Center, 22; Cox's Bar, 20; Hyampom, 16; Cañon Creek, 13. Total, 596; amount, $4,136 24.

TULARE COUNTY.—Cottonwood, 53; Deep Creek, 74; Elbow, 38; Elbow Creek, 89; Fitzgerald, 176; Farmersville, 43; Kaweah, 29; Kings River, 88; Outside Creek, 33; Oak Grove, 50; Packwood, 27; Rockford, 49; Tule River, 87; Union, 61; Visalia, 395; Venice, —; Vandalia, 79; Willow, 38; Harmony, 46; Mountain View, 68; Pioneer, 43; Plain, 22; Antelope, 68; Pleasant Grove, 75; Sand Creek, 44; Elder, 27; Wicker, —; Yokohl, 63; Lake, 124; Burton, 43; Cove, 45; South Tule, 41; Mussel Slough, 59. Total, 2,177; amount, $15,108 38.

TUOLUMNE COUNTY.—Sonora, 484; Columbia, 318; Jamestown, 136; Big Oak Flat, 136; Tuttletown, 118; Poverty Hill, 86; Chinese Camp, 74; Shaw's Flat, 61; Moccasin Creek, 52; Green Springs, 51; Curtis Creek, 49; Springfield, 46; Soulsbyville, 44; Confidence, 43; Blanket Creek, 33; Willow Springs, 30; Sullivan's Creek, 26, Don Pedro's Bar, 24; Corner, 24; Phœnix, 17; Montezuma, 49; Summersville, 44. Total, 1,945; amount, $13,498 30.

VENTURA COUNTY.—San Buenaventura, 428; Sespe, 72; West Sespe, 52; Live Oak, 15; Ocean, 48; Saticoy, 55; Pleasant Valley, 79; Santa Clara, 49; Brigg's, 23; San Pedro, 79; Huenema, 76; Ojai, 50. Total, 1,026; amount, $7,120 44.

YOLO COUNTY.—Prairie, 49; Gordon, 70; Eureka, 68; Washington, 185; Grand Island, 11; Cache Creek, 31; Montgomery, 18; Willow Slough, 28; Fairview, 44; Pleasant Prairie, 35; Center, 55; Spring Lake, 22; Lisbon, 51; Yolo, 122; Grafton, 152; Buckeye, 50; Fillmore, 34; Monitor, 33; Clover, 34; Mount Pleasant, 29; Sacramento River, 30; Woodland Prairie, 23; Buchanan, 31; Woodland, 516; Vernon, 25; Union, 50; Putah, 31; Cañon, 49; Merritt, 50; Plainfield, 74; Cottonwood, 65; Capay, 50; Pine Grove, 30; North Grafton, 46; Monument, 26; Liberty, 43; Franklin, 20; Cacheville, 78; Fairfield, 32; Enterprise, 14. Total, 2,404; amount, $16,683 76.

YUBA COUNTY.—Bear River, 137; Brophy's, 42; Brown's Valley, 42; Buckeye, 35; Clark, 23; Cordua, 29; Dobbin's Ranch, 36; Elizabeth, 40; Greenville, 37; Hansonville, 22; Honcut, 31; Indian Ranch, 47; Junction, 22; Linda, 60; Long Bar, 24; Lone Tree, 41; Marysville, 1,065; McDonald, 21; New York, 57; Oak Valley, 39; Oregon House, 46; Peoria, 39; Plumas, 61; Prairie House, 30; Rose's Bar, 214; Sharon Valley, 63; State Range, 130; Spring Valley, 44; Strawberry Valley, 32; Virginia, 51; Yuba, 44; Woodville, 7. Total, 2,601; amount, $18,050 94.

HENRY N. BOLANDER,
Superintendent of Public Instruction.

LIST OF DIPLOMAS AND CERTIFICATES granted from December 5, 1874, to January 16, 1875. The date immediately following the name gives the time of the expiration of the diploma or certificate.

Educational Diplomas.

Babcock, Wm. S., Jan. 4, 1881.
Barbour, Aron C., Dec. 5, 1880.
Brown, Geo. J., Dec. 5, 1880.
Crothers, Marg. J., Dec. 5, 1880.
Feller, Lorenzo, Jan. 4, 1881.
Hawks, Miss Carrie M., Dec. 5, 1880.
Johnson, G. N., Dec. 18, 1880.
Knighton, Wm. A., Jan. 4, 1881.
Lillie, Jno. B., Dec. 5, 1880.
Lynch, W. F. B., Jan. 4, 1881.
Martin, Jas. M., Jan. 4, 1881.
McFadden, Jno., Dec. 18, 1880.
Owen, Miss Georgie, Jan. 4, 1881.
Pendegast, H. B., Jan. 4, 1881.
Redway, Jacques W., Jan. 4, 1881.
Soule, Marie L., Dec. 5, 1880.
Standish, Miss H. M., Dec. 18, 1880.
Ward, Miss Mary A., Dec. 5, 1880.
Yates, Miss Lizzie, Jan. 4, 1881.

First Grade Certificates.

Ashurst, Miss Pamela E., Dec. 5, 1878.
Augustine, Samuel M., Jan. 16, 1879.
Butler, Miss Orpha, Jan. 16, 1879.
Casey, Mary Elizabeth, Jan. 16, 1879.
Casterlin, Mrs. M. A., Jan. 16, 1879.
Classen, Louise M., Jan. 16, 1879.
Cox, Mary M., Jan. 4, 1879.
Custer, Mrs. Anna M., Dec. 5, 1878.
Everts, Edward, Jan. 16, 1879.
Fitzgerald, Nehemiah, Jan. 16, 1879.
Fitzpatrick, Ella M., Jan. 16, 1879.
Gaines, Chauncey, Jan. 16, 1879.
Gavin, Paul Achille, Jan. 16, 1879.
Hamilton, Jas. T., Jan. 16, 1879.
Hansford, Thaddeus, Jan. 16, 1879.
Harvey, Oliver T., Jan. 16, 1879.
Havens, Carrie, Jan. 4, 1879.
Hayburn, Annie M., Dec. 5, 1878.
Hiatt, Mrs. Henrietta H., Jan. 16, 1879.
Irelan, Jennie B., Jan. 16, 1879.
Kelly, Susie E., Jan. 16, 1879.
Killpatrick, E. C., Dec. 5, 1878.
King, Mamie E., Jan. 4, 1879.
Kirkland, Cordelia S., Jan. 16, 1879.
Loofbourrow, Elias, Jan. 16, 1879.
Lundt, Jennie C., Jan. 16, 1879.
Mills, Myron, Dec. 5, 1878.
Packard, Lizzie A., Jan. 16, 1879.
Pedler, Mrs. F. A., Jan. 16, 1879.
Rayl, Mrs. Martha, Jan. 16, 1879.
Snell, Richard B., Jan. 16, 1879.
Sturges, Selden, Jan. 4, 1879.
Tyus, Mary A., Dec. 5, 1878.
Wallace, Alma, Dec. 5, 1878.
Wallace, Geo. W., Jan. 16, 1878.

Second Grade Certificates.

Bailey, Lydia A., Jan. 16, 1878.
Blackman, G., Jan. 16, 1878.
Burscough, Lizzie, Jan. 16, 1878.
Campbell, Kate A., Jan. 16, 1878.
Clawson, Wm. F., Jan. 16, 1878.
Crawford, Alonzo, Jan. 16, 1878.
Fagan, Mary, Jan. 16, 1878.
Gates, Miss Sophia B., Jan. 16, 1878.
Gibbs, Geo. Jefferson, Jan. 16, 1878.
Hanscom, Geo. Tyler, Jan. 16, 1878.
Henry, Libbie S., Jan. 16, 1878.
Hull, A. J., Jan. 16, 1878.
Johnson, Samuel, Jan. 16, 1878.
Millett, Libbie W., Jan. 16, 1878.
Patterson, Isabelle, Jan. 16, 1878.
Ray, Maria, Jan. 16, 1878.
Roberts, Benj. F., Jan. 16, 1878.
Robinett, Margretta M., Jan. 16, 1878.
Sallee, J. W., Jan. 16, 1878.
Stewart, Jessie M., Jan. 16, 1878.
Strange, Miss Emma M., Jan. 16, 1878.
Sullivan, Nora G., Jan. 16, 1878.
Taylor, Miss Frankie, Jan. 16, 1878.
Tibbitts, Mrs. Elizabeth B, Jan. 16, 1878.
Underwood, Mary C., Jan. 16, 1878.
Vrooman, Emily M., Jan. 16, 1878.

Third Grade Certificates.

Beane, Emma H., Jan. 16, 1877.
Brigham, Henrietta M., Jan., 16, 1877.
Bronson, Camilla R., Jan. 16, 1877.
Lovejoy, Mrs. Belle, Jan. 16, 1877.
Madden, Jennie L., Jan. 16, 1877.
Mansfield, Anna Adams, Jan. 16, 1877.

Third Grade Certificates.—Continued.

Burnell, Electa J., Jan. 16, 1877.
Donnelly, Louisa, Jan. 16, 1877.
Ellis, Carrie M., Jan. 16, 1877.
Ephraim, Janette, Jan. 16, 1877.
Glidden, Flora A., Jan. 16, 1877.
Hull, Lottie J., Jan. 16, 1877.
Jehu, Marian, Jan. 16, 1877.
Kerr, Miss Margaret, Jan. 16, 1877.
Kraus, Emma F., Jan. 16, 1877.
Levy, Hattie, Jan. 16, 1877.
Murphy, Miss Nellie, Jan. 16, 1877.
O'Donnell, Sarah F., Jan. 16, 1877.
Pelham, Mrs. Mary E., Jan. 16, 1877.
Simon, Malvina, Jan. 16, 1877.
Smith, Lillie W., Jan. 16, 1877.
Starkweather, Clara E., Jan. 16, 1877.
Sullivan, Nellie, Jan. 16, 1877.
Thompson, Sadie R., Jan. 16, 1877.
Valleau, Sophie, Jan. 16, 1877.

EDUCATIONAL ITEMS.

CALIFORNIA.

THE new school-house at Modesto, the county seat of Stanislaus, is completed.

THE Board of Education of San Francisco has declared that the Lord's Prayer is sectarian and partisan, and has refused to allow it to be read in the schools.

THE Board of Education of Vallejo have instructed the teachers in the public schools to devote as much time to teaching music as time and circumstances will permit.

EDUCATION IN SANTA ROSA.—Four hundred and fifty-five of the 750 school children of Santa Rosa District are attending the public schools. There are 300 students attending the colleges located at Santa Rosa.

THE statement made in some of the papers that President Gilman had accepted the Presidency of the John Hopkins University is wholly unauthorized, and not true, in fact.

SANTA CRUZ has voted in favor of issuing bonds to the amount of $20,000 for the purpose of erecting a new school building. The work is to be completed in time for the beginning of the Summer term.

THE Hollister Seminary, which has been under the control of Professor Morris and wife, has changed hands. This institution was established about eighteen months since. Mr. and Mrs. Harris have purchased the property and will conduct the school jointly.

TRUANT OFFICER IN PETALUMA.—The Board of Education did a right and proper thing in appointing an officer to look after the young hoodlums who go to school when they feel like it and stay away whenever they please. We understand that measures are in contemplation for the strict enforcement of the Compulsory Education Law.—*Petaluma Argus.*

TO BE ENFORCED.—The Board of Education in San Francisco has adopted a plan for the enforcement of the compulsory education law. The city will be divided into six districts. Truant officers will canvass the city and enter in a book the name, age, sex and residence of all children not attending school, and copy the same into a record book to be kept among the archives of the department.

AT MERCED the new and really elegant school-house is completed. The cost of the structure has been a little less than $20,000. From the day of its completion begins a new era in the educational interests ol Merced. There are about two hundred pupils in this district already, and the number is daily increasing. The seats for the new building are single desks, and very nicely arranged with ink-wells and all modern improvements.

THE NEW SCHOOL BUILDING.—The addition to the Visalia public school-house now being constructed will give us a building unsurpassed by but few of the interior towns of the State. The main part of the new structure is 80 by 32 feet square, and two stories high. A wing is also added, 32 by 22, of the same hight. This will furnish library, class and recitation rooms much needed, besides furnishing enough additional seats to accommodate all the children of the district.—*Visalia Delta.*

THE TEXT-BOOK QUESTION.—In the District Court, March 3d, the case of the People vs. the State Board of Education, involving the validity of their action in changing from the McGuffey Readers to the Bancroft, came on for hearing. By consent ol the parties a *pro forma* judgment was entered, without discussion or examination, in favor of the plaintiff, with a view to a speedy appeal to the Supreme Court, where the question will be argued at length, and an early decision had. Before the 1st of June, the time fixed for the change, the whole matter will probably have been definitely settled.—*Sacramento Record-Union.*

SCHOOL TEACHERS.—There are on the books of the San Francisco School Department the names of 400 applicants for employment as teachers, and yet schoolmarms never die and seldom resign, save to get married; for marriage being the sought-for goal of every woman's life, she gives up all former employments, pleasures and freedom to become the slave of her husband—or his master and tormentor. And yet these girls will not consent to go into the country, where their services are wanted as teachers! There are many reasons for this: First, they would be absent from the family; second, country life has no charms for them; third, they don't want to marry a clod-hopper and might miss the opportunity of securing a city worthlessness; and lourth, country pay is usually smaller than city pay.—*Sacramento Bee.*

SAN FRANCISCO SCHOOLS.—From a report to the Superintendent of Public Instruction we compile the following statistics: Number of pupils enrolled during the year: In high schools, 571; in grammar schools, 11,141; in primary schools, 17,591; in ungraded schools, 842; in colored schools, 85; in evening schools, 3,223. Average daily attendance: In high schools, 500, or nearly 88 per cent. of total number enrolled; in grammar schools, 7,867, or 70 per cent. of total number enrolled; in primary schools, 10,202, or 58 per cent. of total number enrolled; in ungraded schools, 475, or 56 per cent. of total number enrolled; in evening schools, 604, or 19 per cent. of total number enrolled. The financial statistics are as follows: Receipts, including balance on hand January 1st, 1874, $634,478 28; expenditures, $666,006 25, of which $508,628 60 are for teachers' salaries.

HONORABLE RECORD OF A SAN FRANCISCO BOY.—James Glennon, the student of the State University who was appointed a naval cadet, is making a splendid record for himself at the Annapolis Academy. He stands fifth in a class of 105, on the average of studies, and second in mathematics. Cadet Glennon is a graduate of the Boys' High School ol San Francisco. He always stood at the head of his class. Two of his class mates contested vigorously for the secoond position in the class, and often studied until late at night in order to secure some slight advantage, but young Glennon held his post of honor without any extra effort. The students never thought of ousting Glennon from his position and confined their attention to the second place. It was Glennon's custom to devote all of his spare time to the assistance of his mother, who is a poor widow, and he seldom studied at home. His success is due to his own ability.

THE NEW AGRICULTURAL LECTURES AT BERKELEY.—Professor C. E. Bessey, M. S., of the Iowa Agricultural College, has commenced the courses of lectures which he has been invited by the Regents to deliver at Berkeley. The first course will be on "Economic Botany, or the Vegetable Products Used by Man," including a discussion of the cereals, forage plants, textile plants, medical plants, timber, etc. The second course will be on "The Improvement of Varieties in Plants and Animals," including a discussion of the principles and methods which control such improvements. Students in agriculture are required to attend these lectures; resident graduates and the senior class are advised to do so; the members of the University generally, and other persons interested in horticulture and agriculture, are invited to attend. The lectures will be given in the senior lecture room, north hall, room 17, on Mondays, Tuesdays, Wednesdays and Thursdays, at 3 o'clock. On Fridays, in the assembly, at a quarter past 2 o'clock, Professor Bessey will deliver four public lectures, beginning January 22d, 1875.

OTHER STATES.

FREE hand drawing has been made a part of the regular course in the Brooklyn schools.

A BILL has been introduced into the Ohio Legislature making some very radical changes in the school law of that State. The bill declares that the English alphabet, spelling, reading, writing, arithmetic, grammar, geography, composition, conversation and elocution, shall be the only branches taught.

GERRIT SMITH has just given ten thousand dollars to Hamilton College, at Clinton, New York, to be used at the discretion of the Trustees of the Institution. Smith gave the college ten thousand dollars last year for general purposes, and lately ordered a portrait of President Backus to be placed in the Memorial Hall.

THE last report of the Commissioner of Education estimates the aggregate scholastic population of the 37 States and 11 Territories, between 6 and 16 years, to be 10,288,000. In expenditure per capita of school population, Massachusetts heads the list at $21 74. North Carolina reports only 55 cents per capita of school population.

A LECTURER before the Chemung County (N. Y.) Teachers' Institute, said that among the faults of our common schools were cheap teachers and poor school houses. Parents, he declared, oppose spending money for good teachers with useful apparatus. They do not manifest as much interest in caring for the health and improvement of their children while in school as in looking after their stock.

IN Holland it is required of a telegraph operator that he must be a Netherlander, not younger than eighteen nor older than twenty-five years; of irreproachable character, healthy, without bodily defects, and a quick, clear and elegant penman. He must present a thesis in Dutch, sound, grammatical and in good style, and pass an examination in the French, English and German languages, arithmetic, algebra, geometry, geometrical drawing and geography. To attain any degree higher than that of apprentice he must give proofs of his efficiency yet more startling than those above enumerated.

BOOK NOTICES.

THE SANITARIAN FOR FEBRUARY, 1875,

Is unusually interesting to the general reader. Nearly the whole number is filled with articles of direct practical applicability to every day affairs. The *Sanitarian* is doing a noble and much needed work.

VICK'S FLORAL GUIDE FOR 1875

Far surpasses similar issues of former years. The *Guide* is a useful compendium of information in regard to the habits, culture and value of flowers and vegetables. The illustrations are numerous and excellent; the suggestions and directions dictated by that wisdom which is acquired by long and successful experience. The priced catalogue forms an appendix, instead of being embodied in the *Guide* as is former years. The *Guide* is published quarterly, at 25 cents a year.

PETER HENDERSON & CO.'S SEED CATALOGUE AND SPRING CATALOGUE OF NEW, RARE AND BEAUTIFUL PLANTS, FOR 1875,

Will be of interest and use to all lovers of flowers. These catalogues give a great deal of desirable information in regard to the desirability and culture of plants.

HARPER'S MAGAZINE FOR MARCH, 1875.

Harper's Magazine for March, with over a hundred illustrations, is crowded with the richest variety of interesting reading matter. The opening article, by William H. Rideing, profusely illustrated, introduces us to the bold scenery, curious antiquities and quaint customs of the Isle of Man. A briefer illustrated article, by J. D. Champlin, Jr., describes the wonderful and picturesque Mont St. Michel. James Parton continues his illustrated papers on Caricature, this month treating of "Caricature in the Middle Ages," with especial reference to those burlesque designs which disfigured cathedrals and prayer-books. Eugene Lawrence gives a series of pen-and-ink pictures of the "Remains of Lost Empires," accompanied by magnificent engravings. A thrilling story is told by S. S. Conant, in another illustrated paper, of David Livingstone's researches in Africa, and his last days. The Fifth Paper of the Centennial Series concludes the review of Mechanical Progress, with an exceedingly interesting and profusely illustrated account of those inventions of the century which concern printing and bookmaking. John Bigelow concludes his remarkable paper on "De Witt Clinton as a Politician," giving us a striking account of the antagonism between Clinton and Van Buren, of Clinton's duel with Swartwout, and of his Presidential aspirations. The second installment is given of Miss Thackeray's serial story, "Miss Angel;" and the "Rape of the Gamp" is continued. There are two excellent short stories. The poetical contributions comprise "A Charming Woman," by John G. Saxe; "Two Sonnets," by Alfred H. Louis; and "A Dream," by Miss H. R. Hudson. The editorial departments are especially interesting, Mr. Curtis contributing one of his most characteristic Easy Chairs, and the Scientific Record being unusually full and interesting.

ST. NICHOLAS FOR MARCH, 1875,

Opens with a new version of one of La Fontaine's fables. The continuation of Miss Alcott's story, gives us a delightful glimpse of the "Eight Cousins" at home. The other stories are equally interesting. Of instructive articles, we have an unusually numerous and good collection. "Jack-in-the-Pulpit" is as bright as ever.

THE READING CLUB AND HANDY SPEAKER. No. 1. Edited by George M. Baker. Boston: Lee & Shepard. Sacramento: A. S. Hopkins.

THE COLUMBIAN SPEAKER. Selected and adopted by Loomis J. Campbell and Oren Root, Jr. Boston: Lee & Shepard. Sacramento: A. S. Hopkins.

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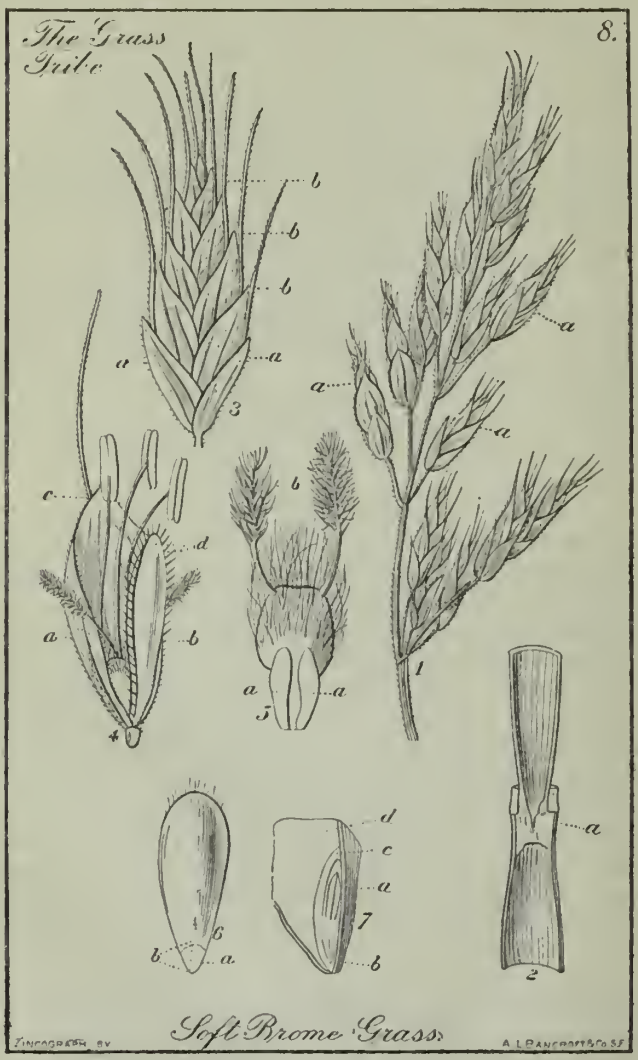
[*For the California Teacher.*]

BOTANY FOR SCHOOLS.

GRASS FAMILY.

One of the most common grasses of California, is the Brome-grass (*Bromus virens*). It differs but little from the one represented in the plate (*Bromus mollis*). The California Brome-grass is an annual with an erect stem, about three or four feet high, and sometimes more or less covered with fine hairs. The stem requires more than mere external examination. Strip it of its leaves, so as to lay bare all its surface, and you will find it hard and thickened at every joint where a leaf has been torn off. Split it, and instead of the solid center of other plants, you will see that it is hollow, and consists of nothing but a cylindrical shell (fig. 2); at the joints, however, the sides of the cylinder meet and form a firm partition, which completely separates one part of the stem from the other. It is this structure that renders the Bamboo so useful for forming cases to hold rolls of paper.

The leaves of the Brome-grass are hairy, narrow and sharp pointed at their lower end, which, notwithstanding its breadth, is considered to be their stalk; it rolls round the stem forming a kind of sheath, which sometimes is not very easily unrolled. At the upper end of the sheath you may remark a thin white


The Grass Tribe
8.
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2
Soft Brome Grass.

membrane, such as you have nowhere met with before. Botanists call such a membrane a *Ligula*. Thus far then we have two peculiarities in grasses: their hollow round stems, with partitions at the joints, and the ligulate leaves.

The flowers are still more unlike what you have before seen. At the top of the stem of the Brome-grass, a number of slender branches appear, turned chiefly towards one side, and by their weight giving a somewhat nodding appearance to the parts they bear (fig. 1); those parts (*a*, *a*, *a*) are oblong green bodies, apparently composed of scales, after the manner of a leaf bud; in reality they are little collections of flowers, whence they are named *Spikelets* (or *spiculæ* or *locustæ*, as they say in Botanical Latin).

Each spikelet is constructed as follows: firstly, at its base (fig. 3, *a*, *a*) are two green scales, each of which has about five ribs; these are the *Glumes*, strictly speaking; there is no trace of either pistils or stamens in their bosom; on the contrary, they are always found to be perfectly empty. When the glumes are removed, you come to some other parts, which, at first sight, look like glumes; but, on a more careful inspection, you will remark that they are composed of more scales than one, have a stiff bristle at their back, and contain some stamens and other parts in their bosom. These are called *Florets*; in the Brome-grass, there are about ten of these placed one above the other in two opposite rows (fig. 3, *b*).

Each floret consists of two scales called *Paleæ* (fig. 4, *a* and *b*), of which the more external (*a*) is the larger; it is covered all over the outside with soft hairs, and bears at its back, a little below the end (*c*), a stiff bristle, called the *Beard* or *Aron* (*arista*); the beard is in reality the mid-rib of the palea, partially separated and lengthened out. The inner palea (*b*) originates from above, and within the base of the outer is much smaller and more membranous, has its edges abruptly doubled inwards, and bears a row of stiff bristles on the angles (*d*) formed by the doubling. These two are the lower or outer, and upper or inner paleæ.

Next the paleæ come, on the side of the outer palea, two exceedingly small scales (fig. 5, *a*, *a*), which are much shorter than the ovary; they are called *hypogynous scales*, and are supposed to be the rudiments of a calyx or corolla.

From the base of the ovary, arise three stamens (fig. 4) whose filaments are white, and so weak and slender, that the long narrow anthers hang in a state of oscillation, in consequence of the inability of the filaments to support them.

The ovary is a wedge-shaped body, apparently consisting of nothing but pulp, and crowned by a tuft of long hairs (fig. 5); two styles, bearing singular brush-like stigmas, spring from its summit.

In this instance you have all the parts that are usually present in grasses, and you cannot avoid remarking how widely different the whole organization is from anything you have witnessed in other plants. The structure of the fruit is not less peculiar.

I have said that the ovary seems as if it were composed of nothing but pulp; it does, however, consist of an ovule and of a shell that includes it, but both are so soft that they grow together and cannot be distinguished. Immediately after the styles wither, the ovary swells, gradually loses its softness, and at last when ripe is nearly bald, having gained a sallow appearance, and become longer and thinner. At the period of maturity (fig. 6) there is still no means of separating the shell of the fruit from the skin of the seed, so completely are they grown together; the fruit looks, therefore, so like a seed, that it is no wonder that it should popularly be called so; it is better, however, to designate it a *grain*. If you crush the ripe grain you will find its contents of a hardish, horny consistence, but easily reduced into the state of flour. From what you have seen in other instances, you will easily recognize this for albumen. Now follow me attentively to find the embryo amidst all this flour. The ripe grain is much narrower at one end than the other, and more convex on one side than the other. Turn the grain on its flat side, so that the convexity is uppermost, and then carry your eye to the narrowest end; there you will espy a minute oval impression (fig. 6, *a*); if you carefully lift up the skin of this part, you will detect the embryo lying snugly, half buried in albumen. It will appear like a greenish-yellow, plano-convex, oval body, in which you can discern no marks of organization. But if you will divide it perpendicularly with a sharp knife, you will then be able to see that it has a most complete and highly developed structure. You will find (fig.

7) that it consists of a thickish scale (*c*), upon which lies a little conical body (*a*), composed of several minute sheaths fitted one over the other; the scale is the cotyledon, and the conical body the plumule or young stem. At the lower end of the embryo, may also be made out a sort of sheath lying within the extreme point (*b*). It is the rudiment of the root.

When the embryo first begins to grow, the cotyledon (*c*) swells a little and attaches itself firmly to the albumen by the whole of its highly absorbent surface: the albumen at the same time softening and becoming partially dissolved by the moisture it has taken up from the soil; by this means the nutritive matter of the albumen is conveyed into the cotyledon as quickly as it is formed. The radicle (*b*) is pushed downwards into the soil on one hand, and on the other the plumule rises upwards into the air; both these parts are abundantly supplied with the materials of growth by the cotyledon, until the roots have established themselves in the soil, and are able to pump up food for themselves and for the nascent stem. By the time this happens, the cotyledon has shriveled up, the albumen is exhausted of its nutriment, and all these temporary parts cease to exist.

After the Brome-grass has been thoroughly studied, other accessible grasses should be compared with it. The following may be procured almost anywhere:

Red-Top (*Agrostis vulgaris*); Canary Grass (*Phalaris Canariensis*). This may be readily raised from seeds. Orchard Grass (*Dactylis glomerata*); Kentucky Blue-Grass (*Poa pratensis*); Low Spear-Grass (*Poa annua*). This species grows in waste places, in streets, and in neglected gardens. Common Chess or Cheat (*Bromus secalinus*); Quaking-Grass (*Briza maxima*); Timothy (*Phleum pratense*); Scutch-Grass (*Cynodon Dactylon*); Ray or Rye-Grass (*Lolium perenne*); Darnel (*Lolium tremulentium*); Common Wheat (*Triticum vulgare*); Common Barley (*Hordeum vulgare*); Pampas-Grass (*Gynerium argenteum*); Maize or Indian Corn (*Zea mays*).

MECHANICAL DRAWING.

An Introductory Lecture, by J. D. Hoffman, Instructor in Instrumental Drawing in the University of California.

In speaking to-day about Drawing, I shall take, as you will find, a strictly professional view of the subject. I shall tell you how you may become practical draughtsmen, and also show, that every one who enters upon modern technical and scientific pursuits ought to be a practical draughtsman.

Drawing is the graphical representation of objects, either real or imagined—imagined in our case expressly for the purpose of being carried out in nature and becoming real. I shall not here explain the methods used to represent bodies in space upon the one plane of the paper. I will only remark that the theory of these methods is so simple that you will have no difficulty to apply it as you progress in the practical execution of drawings. But let me sketch the career of the draughtsman. His first practice will be free-hand drawing. All first practice is difficult and somewhat irksome. When you take your pencil in hand and find you cannot do with it what you want to do, you are apt to feel discouraged, and think that to do it requires *special talent*. Disabuse your mind of this idea. All that is required is the conviction that *real work* has begun, and must be carried on with earnest, thoughtful application. Without this application the most exalted talent will produce comparatively but little. Let us look at some real work, executed for industrial purposes—for instance, the designs on calicoes, wall-paper, designs for carpets, etc. Try to copy them or invent some new ones, and you find it requires great skill, or, in other words, a goodly amount of practice to produce anything as good. These designs are mostly produced in the factories by young men and women. By the by, girls make excellent draughtsmen. They have to work expeditiously, and are certainly not paid as artists. The necessity of supporting themselves has made them thoughtful and industrious, and their training rarely consists in more than the first practice I recommend to you, zealously carried through. To become efficient in your profession you are required to go through the Calculus. Now, I have never met the person who discovered at the outset

that he had a special talent for it; still it must be learnt, and you learn it, and you are glad of it afterward. Drawing, in the same way *must* be learnt.

After a little while of intelligent practice you will find that you had more talent than you supposed at first, and the good opinion of yourself will increase with your progress, and with it, the enjoyment in your work. All of you can become good practical draughtsmen, getting more and more expert in proportion as your profession offers you opportunities to execute drawings. The object of free-hand drawing is to discipline hand and eye, the hand being the more teachable of the two Men have eyes, but they see not; they see, but observe not. Some are born blind to color. They will never make painters. Some, even, are born blind to form, and such will never become draughtsmen. I will give a few instances to prove that the eye must be educated to see. When I for the first time came among the negroes of a Virginia plantation, never having seen a colored man, except, perhaps, an isolated specimen in a traveling circus, I could not tell one individual from the other, nor could I distinguish males from females by the features, nor was my eye capable of appreciating the varying expressions of human feelings in their countenances, which gave me at the time a strong presentiment of the Darwinian theory. A boy, brought up in the city finds it difficult to make individual acquaintance with the cattle, when he comes into the country, and he has to be reintroduced to them many times before he knows them. A German lady told me that when she first visited the United States, she thought all the American ladies beautiful, very angels. She saw only the more delicate type of features. After her eye had become accustomed to the new type, educated, she began to perceive the differences in features, and had to acknowledge that there might be a few homely angels.

In your profession you want a keen, observing eye, that will take correct impressions at a glance. The surveyor passes rapidly over an unknown country, but he must see it and observe it. In running the boundary line between California and Nevada, over a very rough, difficult country, I had two flagmen. The fore flag-man had to give sights ahead, in a straight line, often distant a mile and more He had to grope his way through gulches, timber, over rocks; but when he set up his

flag, he was seldom more than ten or fifteen feet off the line. He had an educated, keen eye. The hind flagman had to set up his flag on the station just abandoned by the instrument. He had plenty of time to study the line before him; but still he would get lost on his way from one station to the other, and had sometimes to be hunted up by others of the party, who found him bewildered and exhausted in some place far away from the line. He had eyes, but could not see.

When *at present* you look at some piece of machinery, especially if it be in motion, you will find it very difficult to *see anything*, whereas, when your eye is educated you will perceive the purpose of the construction and understand the thoughtfulness of the arrangement of its parts. The education of the eye begins, like that of the hand, with your first practice, and therefore I wish to impress upon you that your *real work* begins there with it. I will now make a few remarks, showing how to begin and continue your exercises in free-hand drawing. You will understand that I only consider free-hand drawing as the *first practice for the mechanical draughtsman*, but at the same time, you may rest assured, that there is nothing in this practice which will not help you along, if you intend to continue your free-hand drawing into artistic regions.

You must begin with copying simple forms—contour lines from good drawings. I would prefer the forms of nature—forms of leaves, plants, flowers—going from the most simple to complicated ones. These will teach you a good deal besides drawing. Copy these forms; correct your copy patiently; and finally, when true, outline them with an even, deliberate line. Drawings of good architectural ornaments, and for advanced scholars, portions of the human frame, and, finally, figure-drawing, is excellent practice.

With the brush you will have to practice laying on flat tints in India ink and color—next evenly, graduating from deepest shade to light. As soon as you have acquired some experience of hand and eye, you ought to draw from nature the same leaves, plants and flowers you copied from drawings.

In shading, take a cobble-stone or a shell of uniform color, put it before you, and try to reproduce on paper the delicate shading of nature. You will require all your patience and perseverance to master that cobble-stone or that shell, but

when you have succeeded, you will have made great progress in your career as a draughtsman, and your road will become more and more pleasant and enjoyable. Now, many may think that there is no use in drawing ever so perfect a likeness of a cobble-stone. Will it do to have it framed and sent home to be hung up in the parlor? I, looking at these things professionally, think it will; and when hung up, your *picture* may show more real merit than the dashing sketch alongside of it; and I only hope that I may succeed in converting you to my way of thinking.

After having passed through the discipline of free-hand drawing, you will find instrumental drawing quite easy. Accuracy and neatness must become habitual.

We use instrumental drawing only as a means to commit our thoughts—that is our industrial thoughts—to paper, to have them carried out in the shop. Your conceptions may be bold, your combinations may be new and startling, but your drawing must only be true, simple, neat and clear. We have no mannerisms. No art critic can say a word about it. It is a simple statement of facts, and at the same time a statement of your acquirements—of your power to apply your knowledge to practical purposes. Your dexterity in drawing ought to be such that the mechanical execution does not prevent you from expressing your ideas correctly and fluently, I might almost say unconsciously.

Let us now look at the special professions, see what they draw and why they must draw.

The *Surveyor* surveys a tract of land, for instance, the one belonging to this University. From the legal data put into his hands, he locates the outside boundaries, then establishes their geographical position—establishes the position of buildings, fences, improvements, locates the trees, outlines of patches of shrubbery, cultivated fields, and so forth. He runs lines of levels over the whole tract, and finds the elevation of every point of it; in one word he makes a "topographical survey." When he has completed his labors in the field he has two or three books filled with notes and sketches. Though these notes may have been kept very neat and clear, as they ought to be, is the information they contain easily available? Could they not be arranged so that they may be inspected at one glance,

showing all facts in their proper relations? The draughtsman can do this by graphically representing these facts, by making a map.

The *Agriculturist* takes this map, notes upon it the quality of soil, and then he has before him all he requires to lay out a plan, how to plant, where to plant, and what to plant to the greatest practical advantage. He sees the flat and level land, knows the quantity of hill land, the declivity of the hills, whether they slope to the South, East, West or North; in fact he knows everything at one glance.

The *Civil Engineer* takes the map and plans roads, bridges; he locates new buildings, with their proper drainage; lays out works for the supply of water to the buildings or for irrigation; in fact there is no part of his work for which this map does not contain, in the most available form, the data he must consider.

You will see, that maps must be clear, and to make them clear, must be neatly and correctly drawn. The lettering must be plain, that is, the letters must be well made, for the better the letters the plainer the words. This requires some special practice, but the draughtsman who has gone faithfully through the discipline of free-hand drawing will find no difficulty at all; he will find mapping easy work, and will soon be able to make a practically good map, and very soon make an artistically executed one, if required.

The *Architect* is eminently a draughtsman. He puts his ideas to paper, graphically, from the very outset. What he cannot express graphically he gives in a short description the specification. As far as construction goes, his work is identical with that of the Civil Engineer, though seldom of so wide a range. But the Architect must be an artist. His drawing as draughtsman must therefore be continued, in the direction of high art. It is not my purpose to discuss this drawing now; suffice it to remark that he must be a good practical draughtsman before he can become an artist.

The *Civil Engineer* builds roads and railroads. These are usually of such an extent that he cannot afford to make a topographical survey of the whole country, map it and then locate his road on this map to best advantage, and afterwards transfer his location to the ground. There are certain points given

through which his road must pass; villages or towns, the best practicable crossings of rivers, the lowest passes in mountain chains, etc. Between these given points he locates a line by the eye, selecting the easiest grade, and the safest ground for the road-bed, and surveys this line. At the same time he takes the elevation of his line, measures the slopes of the ground over which it passes and notes their direction. Now begin his labors as draughtsman. He plots his line and notes his slopes graphically, that is, makes a map; he makes also a plot of his elevations or a profile of his line. On his map he replaces the sharp angles of his survey, by curves of the greatest radius that the nature of the ground will allow; then, on the profile he lays down grades; none surpassing a certain maximum grade, and at the same time regulating the cutting and filling for the establishment of the road-bed in the most advantageous or least expensive way. A change of grade may require a change of location in the line. He therefore has to make experiments on profile and map, till he finds the line he considers the best. All this work is done graphically, therefore the Railroad Engineer must be a draughtsman.

The *Civil Engineer* as a Constructing Engineer, constructing bridges, dams, water works, etc., must certainly be a draughtsman. His constructions are mostly statical. When he plans a work he can do a great deal of it graphically. Let us suppose, for an example, that he has to apply somewhere a horizontal beam which has to support a given load. He applies his knowledge of statical principles, calculates the dimensions that beam must have for the material he has at his disposal. He makes a drawing of this beam, and this drawing gives to the eye at one glance an exposition of all the principles involved. He has to apply these principles often, in simple and complicated cases. Drawing will educate his eye. He can tell at once, by looking at his drawing, or at an actual structure, if there be a weak point anywhere, or if there be a waste of material. He could not do so by looking at an array of figures giving dimensions of parts. It is impossible to teach to the beginning Engineer how every kind of work is to be constructed. It is sufficient for him to know the principles which are involved, and in what way they have been applied in a practical way to some of the best structures. The modes of application

are innumerable, and he will see new modes every day. If he sees something that seems new and good to him, he ought to make a note of it for investigation, and perhaps further use. How can he do it? He must be a draughtsman, and make a sketch in his note book. If he cannot get near the structure he must have power to draw the proportions accurately, then judge of the principal dimensions by the eye, and note them down. I would recommend to young Engineers this method of taking graphical notes of things they consider worthy of professional notice. It practices the eye, exercises and increases their powers as draughtsmen, and at the same time accumulates material for practical use.

The *Mining Engineer* is partly Surveyor, Civil Engineer, and Mechanical Engineer. He must be a draughtsman, as he acts as either; and I will proceed at once to the consideration of the Mechanical, or as he is sometimes called, Dynamical Engineer.

The *Mechanical Engineer* applies his knowledge to the construction of engines and machines, applying all the forces of nature and disciplining them to industrial purposes to perform some given work. He must be the most accomplished draughtsman, not a draughtsman-artist, but rather a draughtsman-thinker. In his drawings not only statical principles are involved, but the dynamical principles. What he draws is a thing of motion, and still he must necessarily draw it in a moment of repose. Looking at his drawing, he must be able to see his construction in motion, and satisfy all conditions inherent in this motion. The minutest motion of one part produces a corresponding motion in every part. He makes his constructions as compact as possible, and they must often be very complicated, to produce the desired effect. Wheels, levers, screws, some parts sliding, others oscillating, all this must be drawn clear, distinct, definite. Some parts are to be executed in the foundry, to be cast there in iron or brass; some parts to be forged in the smith-shop, from thence are sent to the work-shop and finishing shop to be molded to the exact image of your drawing. These different shops work independently of each other; you give them drawings of the work you expect from them, and their duty is simply to furnish the parts of which you have given them the drawing, accurately in accord-

ance with it. When all the parts are finished the machine is mounted and put together. If the shops have done their duty the machine must work as it was intended it should, provided the "drawings were correct." The whole responsibility lies with the draughtsman. Take now into consideration that in practical life you must do your work expeditiously, necessity may often compel you to do it fast, and you must come to the conclusion that the time allotted here to drawing must be spent in earnest application; and that, as I said before, the real *work* begins with your *first* practice in free-hand drawing.

The drawings which you will make here ought all to be elaborate drawings; not elaborate in an ornamental way, but elaborate in the way of good work. Make every line as good and even a line as you can. Begin slow and you will soon acquire the power to work fast without interfering with correctness, clearness and neatness. What I have said about the education of the eye, mode of taking practical notes, applies also to the mechanical draughtsman; and even more so, as to his eye a greater variety of forms is presented than to that of the Civil Engineer.

In your drawings in practical life you will but seldom make more than outline drawing; but you must know how to shade, execute a machine in relief as it were. This is, moreover, a necessary practice to teach you the difference of appearance of rounded bodies in nature and when represented by mere outlines. You may easily come very near guessing the dimensions of a rectangular beam, while you will find yourself less correct in judging of the diameter of a cylinder, without seeing its cross-section.

I would remind you, that in practical, professional life, drawing is only the means to the end; we do not draw to produce pictures to delight the contemplator. We make the drawing to have our knowledge applied to some practical purpose; it is the means of communication between the thinker—the constructor and the workshop—the executor. You may come into the condition that you employ a draughtsman to do the graphical execution of your idea, as you employ an amanuensis. Still you ought to be a practical draughtsman, to superintend his work and see that he does justice to your knowledge. I close now, hoping that I have given you some idea of

"Drawing;" that I have convinced you that it is an eminently necessary study for those who choose any of the technical professions. I hope that you will enter on this study with zeal and devotion, and be rewarded with signal success.

HOW SNOW IS MADE.

By Adam Stwin.

Johnny spent the holidays in the country—the jolliest place in the world at such a time, at least for a small city boy. But it is not about sleighing or sledding, evening frolics, or anything of that sort that I am to tell you now. To the young readers of the *Christian Union* the doings of this particular Johnny are of no interest save those which have to do with his way of finding out things. This time Johnny learned how to make a snow-storm: not a very big one, to be sure, but still a snow-storm; and that gave him a pretty correct idea of the way big snow-storms are made out of doors. This is how it happened:

You will remember that about Christmas time we had a few mild days, followed by bitter cold at New Year's. It was one of the warm days, and Johnny had ventured out to slide on the hill back of the barn. In a little while he came running in, puffing with excitement, and shouting, "The barn's a-fire! the barn's a-fire!"

"Where?" I asked, starting up.

"On top, I guess," Johnny replied. "I didn't see the fire, —only the smoke. Just see how it rolls over the roof!"

"Are you sure that is smoke?" I asked, when I caught sight of the white wreaths curling over the ridge of the barn.

"Of course," said Johnny. "What else can it be? Hurry and call the men, or the horses will all be burned."

"Don't be alarmed," I said. "The horses are in no danger. Still, we will go and see."

Before I could get my hat, Johnny was scampering towards the barn, which he expected every moment to see burst out in a blaze. When I got there, he stood a little way from the barn-

door, afraid to go nearer, lest the flame should suddenly overwhelm him.

"Do you see any fire?"

"No," replied Johnny; "but just see how the smoke comes over the roof?"

"Let us look inside," I said, opening the door.

Johnny came forward timidly, greatly surprised not to see the barn full of smoke, at least.

"Maybe the roof's a-fire on top," he said.

"Let us take a look at it from the other side," I said, leading the way through the barn.

Everything was quiet in the sunny barn-yard. The cows were calmly chewing their cuds, and the chickens, clustered in a corner, chuckled a little at our approach, as much as to say, "Come and warm yourselves; it's like summer, here."

Johnny took no notice of cows or hens, but hurried to the further side of the yard to get a good sight of the roof.

"Well," I said, as he stopped short and looked a little disappointed, "do you see any fire?"

"No-o-o," he replied, doubtfully; "nor smoke either. It's a perfect swindle! I was sure the roof was a-fire."

"Let us be thankful it isn't. But how came you to make the mistake?"

"Come and see," was his only reply.

I stepped across the yard and saw—just what I expected. There was more water than fire. The warm sun had heated the shingles, melting the snow from off them; and as the moist air next the roof mixed with the colder air above, or drifted into the chilly shade, little white curls of cloud were formed like puffs of smoke.

"What makes the roof steam so?" Johnny asked.

I told him how the sun warmed the roof, and the roof warmed the air next to it. How warm air drinks up moisture—much more than it can hold when cooled; and that the clouds were formed by the chilling of damp air, which made the vapor in the air visible. "See," I said, "on this sunny side of the barn, where the air is warm, you can't see your breath; on the shady side it comes out like a cloud. That is because the cold air chills the moisture in the breath and makes it visible."

Here Johnny went on with his sliding, and I returned to the house.

Some time after, perhaps the next day, Johnny surprised me with the question, "How do you know that it is moisture that makes the breath white in the cold?"

"Go breathe on the window," I said.

"What for?" asked Johnny.

"You'll see when you try it," was my reply.

Johnny went to the window and breathed against the glass.

"What do you see?" I asked.

"Nothing but a blur; but it doesn't stay long."

"Keep on breathing, and breathe faster," said I.

I heard no more from Johnny for two or three minutes; then he said:

"It *is* moisture! See, it is in little drops all over the glass; and one big drop has run down to the bottom."

"Did you ever see anything like that before?"

"Of course," said Johnny. "The glass gets wet so every cold day. Does it all come from our breaths?"

"Oh, no! the most of it comes from the water on the stove. See," I continued, holding a small hand-glass over the urn, "there is no steam that you can see coming from the water, yet moisture gathers rapidly on the glass. The cold glass chills the air next it, making it unable to hold so much vapor, so the moisture lodges on the glass just as it does on the window."

"Is that the way the frost forms on the windows when it is very cold?"

"Exactly; only in that case the moisture freezes as it forms. If you will step into the store-room, where there is no fire, and breathe slowly against the window, perhaps you will be able to see how the frost appears."

Johnny ran to do as I had told him, and I went out to the wood-shed for a big broad-ax that was there.

When I came back he had a long story to tell about the beautiful forest pictures that grew up under his breath; but I had no time to listen to it then. I brought the ax quickly to the stove and held it high over the water-urn, bidding Johnny to tell me what happened.

"It smokes," he said.

"Just as the barn roof smoked," said I. "The cold iron chills the vapor in the air and makes a cloud of it. If the iron does not get warm too soon, you will see something stranger than cloud."

"I can now," cried Johnny. "It's frost."

"So it is," said I. "The iron is cold enough to freeze the vapor as it turns to water. I think something of this sort is going on up in the sky just now."

"Do you?" cried Johnny, eagerly, running to the window. "Where?"

"All over," I said. "The sky was clear but a little while ago; now see how hazy it is. The wind that comes up from the sea is warm and moist, and where it strikes the cold air over the land it turns to cloud. I shouldn't be surprised if we had snow before morning."

"I hope so," said Johnny; and his wish was granted. When he came down to breakfast, the trees were loaded with feathery snow; every fence-post had a snowy night-cap on, and all the ground was covered with a clean white carpet.

He could hardly eat his breakfast, he was in such a hurry to be out to wade in the snow and help shovel paths. But he was soon just as eager to get back by the warm fire again; for it was stinging cold outdoors, notwithstanding the bright sunshine.

After sitting by the stove till he was thoroughly warmed, he suddenly remarked:

"Snow is sky-frost, ain't it?"

"What do you mean by that?" I said.

"Why," said Johnny, "I mean that snow is made up in the clouds just as the frost is on the windows."

"Just the same way," I said.

"What makes it fall, then? Why doesn't it stick to the sky just as the frost does to the window or anything else?"

"The sky offers nothing for it to cling to," said I. "The snow fall last night was caused by the mixing of the warm damp wind that came up from the sea with colder air, which made it give up all its moisture; and the moisture was frozen by the cold air, turning it to snow. The air could not hold the snow after it was formed, so it fell to the ground."

"Did any one ever see snow while it was being made?" Johnny asked.

"Often; and sometimes, when the conditions are just right, it is possible to make a little snow-storm in the house."

"Really?"

"Really. I remember seeing one in a lecture-hall, one cold evening, when a window was opened for ventilation; and at other times in our kitchen at home in very cold weather."

"Could we do it here?"

"Possibly," I replied; "but I'm afraid it is not cold enough to-day. It will do no harm to try."

So we went down to the kitchen, which happened to be very warm and full of steam from a big boiler of clothes, for it was washing-day.

"We've come to make a little snow down here, Aunty, with your permission," said I.

"Go 'long now!" replied good-natured Aunty. "Didn't de good Lord make enough for ye las' night?"

"Quite enough, Aunty; but we want a little storm in the house."

"S'pose you sweep it up den; dars muss enough on the flo' now."

"All right," said Johnny, who was ready to shovel out the snow if need be.

"You see how still and clear it is out-doors," said I to Johnny. "Now watch the door as I open it a little."

So saying, I opened the door quickly, and the cold air rushed in like a great white cloud. Johnny watched the cloud till it disappeared, then cried:

"Where's the snow?"

"We didn't get any; and I'm afraid the air is not cold enough outside or damp enough within to make any. Still," I continued, "we will try again, further from the stove."

We went to a window in the corner of the big kitchen furthest from the fire, and having rolled up the curtain to the very top, I made ready to drop the upper sash suddenly.

"Look sharp!" I said, as a wave of cloud burst into the room and rolled along the ceiling, spitting flakes of snow.

"Spec' dat blowed in from de ruff," said Aunty.

"No, it didn't," said Johnny. "The snow is perfectly still outside."

"Dat's so," assented Aunty. "Jess lem me see dat once mo'."

Again I dropped the upper sash for a moment, and the in-rushing cold air made a cloud along the ceiling, from which a few snow-flakes dropped into the warmer air and quickly disappeared.

"Whar'd dat snow come from? S'pose you 'splain dat mystery to me!" said Aunty, half inclined to think there was magic in it.

"Johnny can tell you," said I, and I left him explaining to black Aunty how the white snow got into her kitchen.

Do you think you could have made it clear to her?—*Christian Union.*

PROGRESS AT THE UNIVERSITY.

A visit to the State University is always interesting and suggestive. Each week in the scholastic year furnishes fresh evidences of progress and prosperity at the institution. The outsider can scarcely keep pace with the changes that are constantly occurring. A few weeks since reference OBTAINED in these columns to the operations in the Agricultural Department of the University. The details then presented to the public, in conjunction with other agricultural news, have just been published in a University bulletin by Secretary Stearns. The propogation of plants of economic value, as well as such species as are more particularly required for the purpose of illustrating general botany and ornamenting the grounds, was begun in July last, and such vegetable forms are as valuable to the pomologist, and necessary to illustrate floriculture and arboriculture have already been produced in large numbers. The entire domain belonging to the University includes 200 acres, sloping to the west, shaped like a parallelogram and presenting a diversified topography. Its lower portion is about 200 feet above the level of San Francisco Bay, and to the east it rises into hills, the summits of which are about 900 feet above the sea level. About 40 acres are reserved for agricultural purposes and experiment, and the remainder of the land is devoted

to the illustration ot the principal and methods of landscape ornamentation, forestry, botany and allied studies. The planting of a standard orchard, for the purpose of correcting the nomenclature of the fruits already in cultivation, and for furnishing hereafter scions and plants for distribution throughout the State, as well as for the introduction of new varieties, to be distributed as above, has received proper consideration. Among those to whom the University is specially indebted for plants and seeds of desirable varieties are Regent Bolander, S. Nolan, Dr. A. Kellogg, W. J. Fisher (naturalist of the Tuscarora Telegraph Sounding Expedition), and Dr. C. I. Anderson of Santa Cruz.

The series of special lectures arranged for this term cannot fail to assist in popularizing the University. These lectures are open to all who are desirous of attending them. They meet a demand which has long been felt in this community. Held on Friday afternoons, after the regular session of the day is over, the lectures are heard with profit by students and outsiders. Some of the best thoughts of the bright men in the University crop out at these Friday lectures, and the influence of the University is expanded by frequent calls upon gentlemen in various walks of life, who lecture upon various specialties. The lectures of this course not already delivered include the following: "The Proposed Improvement of Oakland Harbor" (San Leandro creek), Julian LeConte; "The Geodetic Survey of Colorado, under Dr. Hayden," A. D. Wilson and F. Rhoda, officers of the United States Geological Survey of the Territories; "The Present State of the Art of Telegraphy," James Gamble and S. D. Field, of the Western Union Telegraph Company; "Electro-Metallurgy," Dr. A. Kellogg; "Preservation of Woods," I. C. Woods; "The Crimean War" (in French), G. de Kersaint-Gily, Instructor in French; "Scottish Poetry," Hon. H. H. Haight. On subjects to be announced: Rev Horatio Stebbins and Hon. S. H. Phillips. A course of lectures on "Constitutional Law" has been promised by the Hon. Stephen J. Field, one of the Justices of the United States Supreme Court, who holds the position of Professor of Law in the University.

Yesterday afternoon a reunion was held in honor of the transfer of the keys of the University to the Senior Professor, John LeConte, whom the Regents have appointed to preside over the

Faculty. The University, as befits its dignity, took a new departure on this occasion. The exercises were of a higher order than usually made at social gatherings. The guests of the institution, who consisted entirely of people specially interested in its welfare, were agreeably entertained without the aid of refreshments. The exercises appealed to the social, literary and scientific tastes of those present, and were thoroughly informal. It was just the kind of entertainment which cultivated people appreciate, and it demonstrated that there is just as much sociability without strawberries and cream as with it, and a trifle more. The rooms were cheerful with floral decorations. Scattered around on stands and tables were illustrated scientific works of a popular character. Three powerful microscopes occupied prominent positions near the windows. One of the instruments was in charge of Prof. H. G. Hanks of this city; the second instrument is the property of Mr. Treadwell of Oakland; the third, belonging to the University, was managed by Professor Joseph LeConte. The polarization of light was illustrated through the aid of Mr. Hank's microscope, and mineralogical specimens were shown, and with the others the visitor gazed with interest upon grains of pollen and the antennæ of a centipede. The literary exercises occupied little time. Harry Webb, of the senior class, gave a declamation entitled "The Old Sergeant." Henry Edwards of this city recited "The Curfew Bell," and in response to an earnest recall, provoked irrepressible mirth with a recitation about "The Well of St. Keyne." President Gilman introduced to the assemblage T. W. Reid, the new Principal of the Boys' High School, and Mr. Reid delivered a few happy remarks. The public introduction was a real surprise to Mr. Reid, as he had simply attended the reunion as an invited guest. Miss H. Hodgden, of the class of '76, recited a poem entitled "The Pilot," written by a young lady in the University, which was especially acceptable, as it contained pleasant allusions to the retiring President. In response to a call from J. C. Rowell, a graduate of the University, J. F. Alexander, of the senior class, read a series of resolutions adopted by the class, regretting the resignation of President Gilman. The young gentleman prefaced the reading of the resolutions with a neat little speech. This closed the literary exercises, and the guests loitered about the rooms and listened to the music of the orchestra, strolled about the premises, or departed for home.—*San Francisco Bulletin.*

DEPARTMENT OF PUBLIC INSTRUCTION.

THE amount of State School Fund per census child apportioned last month, was $6.94, instead of $6.96, as published in the TEACHER.

WE wish to state in this connection that the State School Fund, though apportioned to the several counties *pro rata*, must be apportioned by the County Superintendents according to section 1858 of the School Law. We fear that several County Superintendents have apportioned the State School Fund *pro rata*; we request them to read and master section 1858, and re-read our remarks in the TEACHER for August, 1874.

THERE seems to be still considerable incertitude in the minds of several County Superintendents and Trustees, regarding the apportionment of money to new districts. We shall therefore once more revert to this subject. All school moneys apportioned during any school year, must be apportioned exclusively to the districts in existence on the first day of that school year. In other words, only the school districts existing at the beginning of the school year are entitled to the $500 per teacher, provided for by section 1858. A new district can be formed only by the sub-division of an old district. The new district will receive no direct apportionments during the year in which it is formed. It will receive, in accordance with the provisions of section 1582 of the School Law, only its *pro rata* of the money to the credit of the old district at the time school was first opened in the new district, and such as may be apportioned to the old district, after school has been commenced in said new district. It may happen that the money apportioned to the old district is not sufficient to give $500 to each of the two districts into which the old district has been divided. Thus a hardship is frequently engendered by the creation of a new district. To avoid this, it will be advisable, in most cases, to defer the forming of new districts till the month of May or June, so that in the new school year the new districts will receive their apportionments from the County and State direct, and not from the old districts. It will be necessary, however, that a census be taken in the new district before the beginning of the new school year; and to do this the district must immediately organize by electing Trustees. If a census is not taken in the new district in accordance with section 1634, *et seq*, the district will not be entitled, for the next school year, to State and County apportionments, but will receive only a *pro rata* of the apportionments made to the old district.

SECTION 1859 presents, however, another difficulty. Through a clerical error, which crept into the enrolled copy of the School Bill, a new district formed by the division of an old one, is entitled to its apportionment [from the State and county] only when the time that school, maintained in the old district before division, and in the new district after division, is equal to at least *eight* months. Eight months should be *six* months. For to require a new district, which is just formed, to keep school two months longer than an old district already firmly established is required to keep, is against all equity, all sound policy, and the

spirit of the School Law. This provision of the law imposes, furthermore, an impossibility in some cases. For if a new district is formed say in June, by the sub-division of a district which has kept not more than a seven months' school, it will be impossible for the new district to keep the additional month of school required by section 1859. In such cases we shall be justified in deciding that if the new district has commenced school on or before the day the County Superintendent is required to report to the Board of Supervisors the amount of minimum County School Fund needed (section 1812), it will be entitled to its direct apportionments of school money, in place of a *pro rata* of the money which may be apportioned to the old district, so soon as the time school has been kept in the new district amounts to eight months, even though a part of the time school is required to be kept in the new district should fall within the new school year.

SECTION 1577 provides for a change in the boundaries of a district, under certain circumstances. A change of boundaries creates no new district; it only takes away from one district a certain amount of territory, and a certain number of census children, and adds them to another district. The question has now arisen whether the County Superintendent must not make a *pro rata* transfer of school money in accordance with this change of boundaries. Our answer is that the law makes no provisions for any such transfer by the County Superintendent, and therefore no transfer can be made by that officer. A transfer of school money can be made only in accordance with sub-division 15 of section 1617, that is, by the Boards of Trustees.

IF we examine this question from another point of view, it will be found that in most cases equity demands that no transfer of school money be made consequent upon a change of boundaries. The law, in apportioning the school money, waives all consideration of the extent of territory, or its equivalent, the amount of taxable property, and also, within certain limits, all consideration of the number of census children. In other words, the law provides that no matter what the amount of taxable property belonging to a district, and the number of census children within its boundaries, provided the number is less than fifty, but not less than fifteen, the district is entitled to $500, and no more. As it is foreign to the question under consideration, we shall leave out of view the change in the amount of taxable property of a district consequent upon a change of the boundaries of the district. A change in the number of the census children of a district, as long as this change does not lower the number of census children below fifteen, or increase it beyond forty-nine, does not affect the amount of school money to which the law holds the district entitled. If, therefore, by a change in the boundaries of a district, the number of census children does not decrease in one district below fifteen, and increase in the other district beyond forty-nine, no change can take place in the amount of school money to which each district is entitled. If, by an illegal transfer of money on the part of the County Superintendent, or by a legal transfer on the part of the Board of Trustees, one district receives less than $500, and the other more than $500, in the succeeding school year each district will receive $500, irrespective of the transfer of census children from one district to the other, made in the previous school year. This shows plainly that the spirit of the law does not sanction a transfer of money, as long

as a change in the boundaries of a district does not lower the number of census children below fifteen, or increase it beyond forty-nine. If, however, by a change of boundaries in one district, the number of census children should be lowered to less than fifteen, that district will be entitled to only $300; and if, in the other district, the number of census children is increased to beyond forty-nine, the district will, in addition to $500, be entitled to any *pro rata* apportionment of school money which may be made to districts having not less than fifty census children.

ACCORDING to a late decision of the Attorney General, a certificate can only be renewed once, that is, a renewed certificate cannot be renewed.

THIS year, each Census Marshal will be required to furnish his Board of Education or District Trustees with a complete list of all children living within the jurisdiction of said Board, and living within one mile of a public school, who have not attended college, college schools, private schools, public schools, or have not been taught at home. In other words, each Census Marshal must make two reports: 1st, the regular census report, required by section 1634, *et seq.*; 2d, the report required by "An act to Enforce the Educational Rights of Children." It was impossible to combine both reports in one blank, and we have therefore prepared an additional blank for the making out of the second report. County Superintendents and Trustees must be careful to furnish each Census Marshal with both kinds of blanks.

"AN ACT to Enforce the Educational Rights of Children" makes it "the duty of the President of each Board of Education, and of the Clerk of each Board of District Trustees, to cause to be posted three notices of the law in the most public places in the city, or city and county, or in the school district, or published in one newspaper therein for three weeks, in the month of June in each year." We furnish, through the County Superintendents, each district with at least three printed notices of the law, and Trustees are requested to post one notice on the school house door, and the other two in the most frequented places in the district.

EDUCATIONAL ITEMS.

CALIFORNIA.

THEY are about to build a $2,000 school house at Rio Vista.

THERE are 2,914 children enrolled in the public schools of Oakland.

IT is the purpose of the Trustees of Santa Rosa to establish a school for colored children.

A SCHOOL election, to decide upon raising $10,000 by taxation, will be held in Los Angeles, April 10th.

GILROY, by a vote of 151 for and 24 against, has voted $5,000 to build an addition to the public school building.

EX-GOVERNOR DOWNEY will give a gold medal to the most proficient scholar in the public schools of Los Angeles.

A CHEMICAL and philosophical apparatus has been purchased for the use of Santa Clara street school at San Jose, at a cost of $1,000.

THE Board of Education of San Francisco has declared that the Lord's Prayer is sectarian and partisan, and has refused to allow it to be read in the schools.

TWENTY-SEVEN children have been refused admission to the public school in Napa, for want of room to accommodate them, the school being already too much crowded.

THERE was a special election held in the Watmaugh School District, Sonoma Valley, on the question of a tax to build a school house. The total vote was eleven—eight for and three against the tax. The amount of tax to be levied is $800.

THE fine school house in the Auburn district, near Nicolaus, Sutter county, was destroyed by fire on the 11th ultimo. The building and contents destroyed involve a loss estimated at $1,500. The fire occurred at twelve o'clock at night, and is supposed to have been the work of an incendiary.

SAN FRANCISCO.—The estimated running expenses for the support of the San Francisco School Department for the years 1874-75, as exhibited by the Auditor's report, are $678,650. Add to this the interest to be paid upon school bonds for the years 1866-67, 1870 and 1872—$40,740— and the sum total is $719,390.

WALTER S. ALEXANDER, of the Junior Class of the State University, has been appointed to a special cadetship at the West Point Military Academy, by President Grant, and will leave for the East in the month of May. Alexander is the son of General Alexander, the engineering officer. The young man has an excellent record as a student.

APPLICATION has been made to the City Superintendent of Schools at Sacramento for admission to one of the public schools of a Chinese girl, seven or eight years of age, who was born in California, and whose parents reside in Sacramento. The Superintendent referred the question to the Board of Education, and the girl was admitted to the public schools by a vote of 5 to 2.

D. C. GILMAN has resigned the Presidency of the University of California, and accepted that of the Johns Hopkins University in Baltimore. His resignation took effect on the 29th of March. On the renewal of the University exercises after the recess, Professor John LeConte will enter upon the duties of President, having been elected by the Board of Regents to fill the vacancy.

A NEW SCHOOL HOUSE.—The new school house at Clayton is approaching completion, and will be a credit to the people of the District and a great aid and incentive to the advancement of the educational interests. The seats and desks are of the most approved style, and will give the school room a bright and handsome appearance that should gladden the spirits and inspire the ambition of the pupils.

THE Vallejo Board of Education has adopted a rule requiring teachers to attend all regular or special meetings called by the Superintendent; no excuse will be allowed otherwise than would excuse the teacher from regular sessions of the school. Also a rule providing that the parents or guardians of pupils suspended, shall apply to the Superintendent in person before the pupil can be returned to the school.

PRIZES.—Sam Brannan comes to the front as a patron of education. A short time since he offered $50 in seven prizes, ranging from $20 down to $1, to the public school boys of Calistoga, for the quickest memorizing of an 18-page poem entitled "Aspirations and Realizations." The lucky competitors were: Samuel Jacobson, first prize; Frank E. Wolf, second; Lorenzo Smith, third; Leonard Smith, fourth; Henry Irons, fifth; Charles Irons, sixth.

THE Vallejo Board of Education has adopted a set of rules, one of which is as follows: "Any pupil who shall absent himself or herself from one regular examination of the schools, and who shall fail to render a reasonable excuse for such absence, shall be suspended from the school and not be allowed to return without permission of the Board." We regard this as a good rule. The practice of pupils absenting themselves without cause near the close of a term and dropping in again at the commencement of the next term, should be checked. It operates against the discipline and progress of the school, and ought never to be allowed.

RIGHTS OF SCHOOL TRUSTEES OVER SCHOOL PROPERTY.—Two of the Trustees of the Lime Kiln School District, Nevada County, some time since conceived the idea that two school houses in one district was just one school house too many, so they proceeded to tear one of them down. The patrons who lived near the edifice were very much incensed thereat, and caused the officers to be arrested for malicious mischief. The trial took place in Grass Valley last week, and resulted in the acquittal of the offenders, on the ground that Trustees have the control of school property, and can do as they choose about it.—*Nevada Transcript, March 17th.*

A SALINAS correspondent of the Healdsburg *Flag* thus describes the school house at that place: "We have just completed a new school building and furnished it from top to bottom in first-class style, costing nearly $12,000. It is imposing in style and beautiful in design. Gas and water pipes are placed throughout the building. Eight marble wash basins in four rooms furnish pupils with ample accommodation, and each of the four rooms is furnished with a comb, brush and a large looking glass. A new bell calls to study, and thirty-day calendar clocks point the time. A new $625 piano keeps cheerful faces and assists in harmony of music as well as of feeling. The teachers are provided with revolving chairs and all are delighted. We have about 350 pupils."

NINETEEN teachers are employed in the public schools of Vallejo. The highest salary paid is to the Principal of the High School, who receives $170 per month. The teacher of languages gets $150, and the Principal of one of the grammar schools, $125. Three other Principals of grammar schools receive $100 each. Eight other teachers get $80, and three others $70. One other teacher receives $65, and another $60, which is the lowest in the list. The average monthly salary of the nineteen teachers is $90 50. Fifteen teachers are employed in the public schools of Petaluma. The Principal of the Petaluma High School receives $150 per month, and the Principal of the grammar department, $125; one other teacher receives $90, another $70, three $65, five $55, two $50, and one $45. The total monthly salaries of the teachers of the Petaluma public schools is $1,035, and their average monthly salary $69 each.

COLLEGE OF AGRICULTURE.—The current State University *Bulletin* announces that the Regents have arranged for courses of lectures on agriculture, during the present year, in addition to the courses on Geology, Natural Philosophy, Mechanics, Chemistry, etc., by the regular Professors of the institution. The lectures will be given before the College of Agriculture, but are open to all who choose to attend them, whether members of the University or not. Among the lectures announced is a course by Professor Clark, of Massachusetts Agricultural College, and a course by Prof. Morse of the Peabody Institute. Prof. Hilgard, of the University of Michigan, is to deliver a course on the Analysis of Soils, and one on the Chemistry of Household Life. Prof. Bessey, of the Iowa Agricultural College, a course on Economic Botany; or the plants useful and harmful in human industry, and one on the Improvement of Varieties in Plants and Animals. Prof. Brewer, of the Sheffield Scientific School, is to give a course on Stock Breeding. Besides these courses, Henry Edwards has been invited by the Regents to give a lecture on Insects Injurious to Vegetation; Prof. Bolander, one on Forestry; Dr. Strentzel, one on Orange Culture; Horace Davis, one on Wheat; Professors Gibbons and Kellogg, on Local Field Botany; J. W. A. Wright, on Cotton Culture; W. B. Ewer, on the History of California Agriculture; Dr. H. W. Harkness, on the Lower Forms of Vegetable Life, and R. E. C. Stearnes, on the Eucalyptus Tree. This programme of lectures upon subjects pertaining to prac-

tical agriculture, in addition to the regular courses of the permanent Professors in the several scientific branches, indicates a determination on the part of the Regents to omit nothing that promises to advance the Agricultural students.

The Scientific Excursion.—The Oakland *News* of March 23d gives these particulars of a trip to Monte Diablo in the cause of science: "The first of a series of explorations in California under the auspices of the University of California is to be made during the coming spring recess, which occurs in a few days. These explorations or surveys are designed to illustrate and teach in the field what is taught in the lecture-rooms at Berkeley, and will include geology and mineralogy, topography, surveying, zoology, botany and related studies. In conducting this outdoor work the party will be under the usual discipline which is observed in governmental expeditions of the same general character. The objective point in this instance will be Monte Diablo and the country intervening between said place and Berkeley. In order to make the work effective the number of the party is limited, including some of the Professors in the scientific colleges, and past graduate and special students. On the return of the party, the material collected and the field notes and general observations are to be properly worked up and a formal report is to be made to the authorities of the University. The expedition is under the charge of Professor Jos. LeConte. The party is composed of the following persons in their specialities: In Natural Science, Professor Joseph LeConte, Geology; Professor W. B Rising and F. State, Jr., Chemical Geology; A. W. Jackson, Jr., Mineralogy; F. P. McLean, Botany; John Stillman, Geology. The Engineering Department is under the charge of Professor John LeConte, assisted by G. C. Edwards, L. L. Hawkins and E. A. Parker. The above will probably be joined at the mountain by President Gilman, Professor W. H. Brewer, of Yale, now lecturing at the University; Drs. A. Kellogg and W. P. Gibbons, Botanists, and Secretary Stearns in general Natural History.

BOOK NOTICES.

Pestalozzi: His Life, Work and Influence. By Herman Krusi, A. M., Cincinnati and New York: Wilson, Hinkle & Co. Price, $2.25.

While the work before us presents nothing new, it must still prove invaluable to the American teacher as giving the best resumé of the labors of Pestalozzi we have met with in the English language. The author, who is the son of Pestalozzi's first associate, is admirably fitted for the task he has undertaken. His intimate personal relations with the friends and disciples of Pestalozzi enable him to fully understand Pestalozzi's principles; and his thirty years' experience as teacher in Swiss, German, English and American Normal Schools has given him full opportunity to test these principles. He is thus qualified to examine Pestalozzi's system from its very rise and origin; to show the legitimate connection between its principles and their application, and to point out some of the professions and practices that have been falsely ascribed to it.

Mr. Krusi divides his work into five parts. The first treats of the life of Pestalozzi; the second, of the associates of Pestalozzi; the third gives extracts from the writings of Pestalozzi; the fourth explains the principles and method of Pestalozzi; and the fifth outlines the spread of the Pestalozzian System. In this portion of his work Mr. Krusi avails himself of the opportunity of delineating the present state of American primary education.

Mr. Krusi has well performed his task. While gratefully recognizing the value of the ideas of the great reformer, and his services to humanity, he has still

justly and impartially judged the crude experiments by which Pestalozzi endeavored to put his ideas into practice. Mr. Krusi always clearly distinguishes between educational principles and educational means, and has thereby written the most important work on primary education thus far published in the English language. We do not agree with him in every portion of his work; especially must we dissent emphatically from his estimate of Mr. Sheldon's labors. Nevertheless, the work is of such intrinsic value, that no teacher's desk or library will be complete without it. In the words of our author, to those who have never troubled themselves with pedagogical questions, or who are still floating on a sea of uncertainty, this work will present both oar and rudder by which to guide their boat to a safe landing. And inquiring minds it will stimulate to further experiments and discoveries in the field of education and its method, or to a more comprehensive and philosophic investigation of the subject in all its bearings. If books like the present become household works of teachers, all fears of the value and permanency of our American system of education will speedily be silenced; and teachers will receive that recognition for which they have so long striven in vain.

CHOICE SPECIMENS OF AMERICAN LITERATURE, AND LITERARY READER: By Benj. N. Martin. New York: Sheldon & Co.

This is the second edition of Shaw's "Choice Specimens of English Literature." The extracts, which were in the first edition brief and fragmentary, have been replaced by more extended and coherent passages. The number of authors represented in the work has been largely extended. The volume has thus been made the best text-book extant on the writings of American authors.

IDIOMATIC KEY TO THE FRENCH LANGUAGE: By Etienne Lambort and Alfred Sardou. New York: Albert Mason.

This work will prove an indispensable complement to any French Grammar. No other language is, perhaps, so rich in idioms as the French; and the compilation of the most useful and familiar idioms will be of incalculable service to all learners. The idioms are grouped alphabetically, with the literal meaning of the word at the head of the column. The idioms are illustrated with copious and practical conversational examples, with the corresponding English version.

ALL THE FRENCH VERBS AT A GLANCE; WITH PRACTICAL ELUCIDATION OF ALL THE FRENCH SOUNDS, AND COMPREHENSIVE TABLE OF PRONOUNS. By Etienne Lambort and Alfred Sardou. New York: Albert Mason.

"All the French Verbs at a Glance" is represented by a "Table of Models of all regular French Verbs," a "Table of Models of all Irregular Verbs of the French Language," and a list of sentences illustrating the idiomatic use of the verbs *devoir*, *falloir*, *pouvoir*, *vouloir*, *avoir*, *aller*, and *venir*. The first table shows the whole mechanism of all the conjugations in twelve simple rules; the second table shows those parts of the irregular verbs which are irregular, all parts not shown being governed by the rules given in the first table.

In the second part of the book, a series of practical exercises is given by which the pronunciation of the French sounds may be learned with the help of a teacher. Special attention is paid to those sounds which offer the greatest difficulty to the learner.

Next are given the English equivalents of French tenses and moods. Then follows a table, in which all possible combinations of French pronouns are given —a great desideratum, as the arrangement of pronouns presents many difficulties to the learner. "Exercises on Numbers," "Reading Exercises," and a "List of Irregular Verbs" close the book.

The work will prove a desirable "*vade mecum*" to all who study French.

THE INTERNATIONAL REVIEW FOR MARCH–APRIL, 1875,

Opens with an article on Edgar Allen Poe, by Jno. H. Ingram, of London, England, whose chief object seems to be to clear Poe's fame from the aspersions thrown on it by the misstatements of Griswold. Mr. Ingram is carried by his zeal to the other extreme; and instead of a biography which does justice to its subject, we have a panegyric which is as little reliable as Griswold's detractions.

The second article gives a very readable account of the *New York Gold Room*, by K. Cornwallis, of New York. Amasa Walker contributes one of his valuable articles on the *Money Problem*, viewed under the recent legislation of Congress. The remaining articles, three in number, are religious in character: *Hebrew Poetry*, by Philip Schaff, of New York, *Modern Spiritualism*, by Henry Reed, of Washington, D. C., and the *Supernatural as Evidence*, by R. Payne Smith, D. D., Dean of Canterbury, England.

The book notices show, as we have pointed out once before, how illy qualified the editor is for his work. The opening sentence of the first review, proves how competent (?) the reviewer is to examine the subject of "Mental Physiology."

ST. NICHOLAS FOR APRIL, 1875,

Presents its usually rich table of contents. John Spooner's "Great Human Menagerie" will prove the most instructive and entertaining of the articles. Teachers and others desirous of getting up a children's exhibition, will find many very valuable hints in the article. The remaining articles, prose and verse, are of the general excellence of all of the *St. Nicholas* articles.

HARPER'S MAGAZINE FOR APRIL, 1875,

Continues Parton's illustrated articles on caricatures, "Caricatures of the Reformation" forming his subject for this month. David A. Wells contributes his sixth paper on "The First Century of the Republic," the progress in manufactures being this month's subject. Hon. S. S. Cox presents us an excellent article on "American Humor." These three articles are profusely illustrated. The other illustrated articles are "The French Broad," written in that inimitable style of scenic description, dashed with a spice of romance, for which Harper's Magazine has become so famous; and "Angelica Kauffmann;" besides the usual illustrated serials and poems. The editorial departments are full and readable.

LITTELL'S LIVING AGE FROM JANUARY TO MARCH, 1875,

Have given us the best articles which have appeared on the questions agitating the literary world. Exhaustive articles have appeared on the *Greville's Memoirs;* on Huxley's *On the Hypothesis that Animals are Automata, and its History;* on *Modern Scientific Materialism;* on *Nasmyth's Physical History of the Moon;* on the *Life of the Prince Consort;* on *The English Bar and the Inns of Court;* on the *Limits of Science;* on *The Last Journal of Livingstone*. We have besides, Carlyle's *Early Kings of Norway;* Henry Kingsley's *Sir Philip*

Sidney; Religious Revivals in Medieval Italy; Leonardo da Vinci; Erasmus; Julian Hawthorne's *Saxon Studies; Mr. Lowell's Poems; Charles and Mary Lamb; Contrasts of Ancient and Modern History; Ismailia; Classification of Comets; False Economy;* the *Ultimate Consequences of Mr. Gladstone's Pamphlet*, etc., etc. The principal serials have been *Alice Lorraine; Far From the Madding Crowd; Miss Angel, Three Feathers;* and *The Story of Valentine and his Brother.*

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THE

CALIFORNIA TEACHER.

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A VISIT TO TWO SCHOOLS.

PETER ZIMMERMAN.

One pleasant afternoon a few weeks since, anxious to enjoy a walk, I thought to visit a Union Free School, not far distant. From the reports which had gone forth concerning this school, its principal, and the success with which he was meeting, in governing and leading it to a high standard of scholarship, I felt in entering that I would have the pleasure of witnessing the workings of a body of students far advanced, at least in common English branches.

In anticipation of this, I presented myself early during the afternoon session, and saw and heard the following. The first class called was one reading history, and was composed, on that occasion, of twenty boys and girls, from 14 to 20 years of age. This class read according to their numbers, and it soon became evident. that about all each member endeavored to do concerning the exercise was to mark the part which would come to him or her, that there might be no mistake. After doing this and reading their respective parts, the remainder of the time given to the recitation most of the girls spent in whispering, writing notes, and looking about the room, while the boys amused themselves in the laudable enterprise of pulling fingers, pricking each other with pins, and comparing pocket knives, in doing all of which they appeared to be very skillful. Thus the exercise was finished.

The members of this class seemed to have forgotten or never to have known that by following the text as each read, noticing the pauses, pronunciation, emphasis, and spelling, of the words, they could learn much more than by simply reading. The exercise read gives information in regard to the character and reign of Charlemagne, which certainly ought to be of interest to students of the ages of those composing this class. That I might not form an incorrect opinion, at the request of the teacher, I made several inquiries of different members of the class concerning what they had just read, and, after considerable effort, failed to learn from them what were the *Capitulaires* of Charlemagne, what was his policy in regard to the church, what he did for education in his time, or what was the character of the nature of his reign. All that I succeeded in eliciting, which was at all correct, was that, "He must have been a very large and powerful man, as he was nearly eight feet in height.',

By a subsequent inquiry I ascertained that this was the every day method of conducting this exercise; that the teacher seldom explained the meaning of a phrase or sentence, and never questioned the class concerning the information given by the text.

Recitations in arithmetic, algebra and spelling were called, but they failed to show scarcely more knowledge of the subject than the reading. The teacher volunteered the information that the arithmetic class was a good one, had gone over nearly the whole book, and from the answers given to a few questions, I came to the decided conclusion that the class *had gone over* nearly the whole book, and that this was all. On the day of my visit the recitation was concerning cube root, and I am confident that the majority of the class really knew nothing at all about the subject. More than half the class could not find the root to an example containing two periods of figures, while several could not explain the method of finding the cube of any body. This class were unable to show why the divisor is inverted or considered so, in division of fractions; also where in the quotient the decimal point must be placed in division of decimals.

To any person acquainted with the management of schools, it must be evident that this was almost anything but a quiet, orderly and interesting one, that the minds of the pupils were

not engaged with their studies, that they had very little respect for each other and apparently none for their teacher, though he possesses many excellent qualities, and is undobtedly an industrious and thorough scholar,—a much better one than the majority of teachers occupying positions similar to his. But he lacked the calmness, the unvarying kindness and firmness, the power to win friends and to lead, which is so essential to the success of the teacher. It was evident that the reins of government had slipped through his fingers and that they were lost to him, with this little host, forever.

A few days since being in the vicinity of another Union Free School, and a little curious to witness its workings, I availed myself of the opportunity of visiting it. By inquiry I had learned that this school was about equal, numerically, to the one just described, and as they had enjoyed nearly equal advantages as was supposed, they were considered to be about equally advanced. In order to ascertain its real standing as to deportment and scholarship, so far as poossible, I entered soon the opening of the afternoon session. The following came under my observation.

In a short time, at the sound of a small bell, there arose without delay a dozen or more girls, from 10 to 12 or 13 years of age. The bell sounded again, and they stepped to the recitation seat. It was a reading class, composed, on that day, of small girls. Without hinderance the exercise began, the teacher calling promiscuously upon the members. Each one gave her individual attention to the recitation, and read the part assigned in a clear and sufficiently loud tone, noticing the pauses, and reading nearly as she talks. If a mistake was made in the pauses, pronunciation, or emphasis, it was noticed at once, and corrected by several, for the whole class were on the watch for mistakes. This was done in so quiet and earnest a manner, that one could not fail to take pleasure and a lively interest in the entire exercise. It was done too without a whisper being interchanged. During the reading the teacher took occasion to ask questions in regard to the text, and to explain to the class the meaning of such phrases and sentences as he thought they might not fully understand. In this way the exercise was again made interesting, and one that would attract the attention of the most stupid pupil.

This exercise showed some of the many ways which an ingenious teacher can devise to make a study, which is sometimes dry, interesting, and that one of the mottoes of every school should be "understand as you go," for when a class advances farther than that its members are only wasting the precious time of their youth. Other recitations were listened to, and the members of the various classes showed, with scarcely an exception, the same degree of thoroughness and order which had characterized the recitation of the young readers. The answers given to a few questions were a sufficient proof that this school had not convened daily without making progress. Not only were questions answered correctly, but the *whys* and *wherefores* were given. Every recitation had a time and was in its time, as near as was consistent with the welfare of the class, every member of the school was held to his work and understood there could be no shirking, no failures without making them good.

The teacher on his part did his work thoroughly and well. There was no hurry, no fretting, no unpleasant word, no partiality. If reproof was necessary it was given in a kind yet firm manner, which told the pupils in no mistakable way, that their teacher was their friend as well as master, and they recognized him as such.

These two schools were entirely unlike; the one was quiet, orderly, progressive, and cheerfully performed every duty; the other was noisy, confused, performing a part of its duties with reluctance, and leaving others undone. The one was almost the perfect school, the other was nearly its opposite.—*The New York State Educational Journal.*

CLIPPINGS FROM RICHARD A. PROCTOR'S LECTURES.

—If this earth were to grow in density until its mass were equal to that of the sun, then a half ounce weight—one of those that are used to balance our letters—would weigh 4½ tons. A man of average weight would be drawn to the earth at a weight of 20,000 tons. An object raised from the earth a single inch

would, in falling that short distance, acquire a velocity three times greater than that of an express train. Such is the might with which the sun rules this earth.

—And now as to the quantity of the heat of the sun. Sir John Herschel in the south of Africa made experiments to determine the actual quantity of heat that is received from the sun. The heat there was so great that at the depth of four inches below the surface of the sand the thermometer rose to 160 degrees. He was able to cook a steak by placing it in a box covered with glass, and that inside another box with a glass cover, and to boil eggs hard. He made experiments, and found in the first place that about one third of the sun's light and heat were cut off at midday by the air, and taking that into account, and making the requisite calculation for a large extent of surface, he found that the quantity of the sun's heat that fell on an area of one square mile would be sufficient to melt in a single hour 2,000 tons of ice. Well, now that is merely the quantity received by a square mile of the earth's surface—what the earth presents to the sun. How small she is compared to him, and what a small surface she presents, and how little of the sun's heat does she receive! Even regarding for a moment the sun as a spotted disk, 50,000,000 square miles in extent, even then how small is the quantity of the sun's light and heat that this earth actually captures. You have only to consider how small the sun looks in the heavens, and consider how small our earth would look beside him, with this small diameter compared with his, of one inch to three yards, and you can see how small a proportion of the sun's heat we capture. By a calculation which which can be readily made, it is found that only the 260,000,000,000th part, or less than that proportion of the sun's heat is captured by the earth; and all the planets together receive only one 227,000,000th part of the sun's heat. There is another mystery the study of astronomy presents. Only one part in 227,000,000 parts appears to be applied to any useful purpose, and the rest seems wasted. It is not for us to judge of the operations of nature. But there at any rate do we seem to find a confirmation of the saying of the atheist that sounds so strange to us, that "Nature in filling a wine glass upsets a gallon." There is the sun's heat being continually sent forth, and only the 227,000,000th part received. Only imagine a merchant who

spent large sums of money, and who employed only one cent usefully for every $2,000,000 of his income. And that is what the sun appears to be continually doing. The actual emission of solar light and heat corresponds to what would have been obtained if on every square yard of the sun's surface six tons of coal were consumed every hour In every second the sun gives out as much heat as would be given out by burning 11,600,000,000,000,000 tons of coal; and this earth on which we live, if its whole surface were glowing with the same heat as the sun would give out in every second, the same amount of of heat would be given by burning up 1,000,000,000,000 tons of coal. One million million tons of coal in every second of time!—a globe only as large as our earth, while the sun, the great center of our system, gives out every second an amount of heat that would be given out by burning 11,600,000,000,000,000 of tons of coal, or about eight times the whole supply of coal supposed to exist in this earth. In every second the sun gives out the whole supply of that coal which we look at as inexhaustible, but which we are consuming at such a rate that in 3,000 or 4,000 years hence there can be but little doubt the coal will be exhausted upon the earth.

—The sun in one observed instance sent in an immense mass from its surface with an eruptive force of 500 miles per second.

—The sun seems to us to be perfectly still. When we consider what we have learned about him we know that all the forms of uproar on this earth are as absolute quiet. Even the hideous groanings of the earthquake is surpassed a million fold by the disturbances on every square mile of that inflamed sea. This is no idle dream. This great central machine of the solar system, this central heart pulsates with life and will continue to do so until the fuel is exhausted. How does the sun maintain this fire? Why is there no gradual loss of energy? If the sun were a mass of coal of the same bulk, that coal, in the course of 5,000 years, would be entirely consumed, and the sun would be a mere cinder. If the sun were a mass of water, which has a quality of specific heat in its combinations by which it gives out more heat than any other matter, in the course of 5,000 years it would lose 1,500 degrees Fahrenheit in temperature. There are two theories of the manner in which the sun's heat is kept

up. One is by the downfall of meteoric matter. The other is that it is maintained by the gradual contraction of its substance, the same process by which the rest of the solar system was formed. I may say there is certainly a time in the far future when the sun's heat will be exhausted.

—Comets are mere masses of vapor. The comet of 1860 was acted upon so powerfully by the sun that it threw out a tail 90,000,000 of miles in length in four days. One comet has been seized upon by the planet Jupiter and appropiated entirely.

—Comets are accompanied in their course by crowds of meteors. Indeed all space seems to be full of these little moving bodies. Prof. Newton has discovered that about 400,000,000 meteors fall upon the earth every year. There is such an immense number of these meteors around and in the solar system that there is every reason to believe that we should see an aggregation of them around the sun, as we do in the corona. Meteors are probably matter expelled from the sun, and perhaps from the larger planets, and examination shows that they have formerly, been in a vaporous condition. The earth is very slowly increasing in size from the meteors which are falling into it daily, and we are protected against injury from them only by the fact that most of them are dissipated by the atmophere into a vaporous dust.

LETTER FROM A COUNTRY SCHOOLMARM.

MR. EDITOR—I hope I have not closed your ears by thus frankly avowing myself one of that unfortunate class living outside of city advantages, for I am humble and willing to learn. I am intensely interested, as country teachers often are, in all that school authorities in cities do or say, and I always read the "Manual of Public Schools of the City of Providence." In the issue of September, 1872, I found a remarkable addition to the contents of that interesting pamphlet, viz: an "order of exercises" for primary, intermediate, and grammar schools, which was intended, I presume, to kindly relieve the teachers from any trouble of deciding upon their course of labor from day to day. We have made some attempt

at grading in our "deestriet," and I am placed in charge of the younger scholars in a room by myself. I had been in the habit of writing out a general order of exercises as a guide, and then modifying it according to the needs of the day. If a lesson in a particular study chanced to be unusually difficult, or one of my classes had more trouble with one lesson than another, I made it a rule to spend more time on that lesson and let something else go.

If it chanced to be one of those disagreeable days when no one has much ambition or energy, and children lose all interest in their work, I felt at perfect liberty to have general exercises to enliven and wake them up even if it were not Friday, leaving hard work for another time. However, the "order of exercises" seemed so definite and systematic—like having your religion given you whole, without the trouble of thinking or deciding for yourself—that I embraced the idea with enthusiasm. I pictured to myself the marvelous perfection of machinery in the Providence schools; how the scholars of similar grades, no matter how they might differ in disposition or capacity, were aot only learning exactly the same quantity of the same studies, by the use of the same methods, but every minute in the day was employed in the same way. I even saw in a vision the plan carried out still farther, and primary schools, for instance, all over the country reciting the multiplieation tables, or spelling baker at the same time, each day. This is system, I said, and determined to do my best to chime in with the others. But alas, I am, after heroic and persistent efforts, forced to the conviction that either human nature in "our town" is very different from that of Providence, or I am incapable of the order and system I admire so much. My lessons are either too short or too long; they spill over and run into each other. My scholars seem to require some discipline, and no time is allowed in the admirable "order of exercises" for such matters; in the Winter time my children have to take some minutes each day to put on and take off India rubbers, coats, shawls, and hoods, and in the Summer time they must be "watered," like other animals. More than all, there are many occasions when, by obeying the "order of exercises" and going by the clock, I am obliged to stop a recitation just at the critical moment when the interest of the scholars is so awakened

that a few minutes more would tide them over their difficulties and fix the lesson firmly in their minds. To retard the education of the individual school you are placed in charge of, for the sake of securing uniformity of action with schools of which you know nothing, seems a little like "putting the cart before the horse"—excuse the country phrase—but I am very unwilling to place my own poor judgment and experience in opposition to the theories of the honorable committee of Providence schools. Will not some city teacher kindly inform the less favored country schoolmarm *how to do it?* The human nature we have to deal with, in ourselves and in our pupils, seem to require a *little* freedom of action, and though we are all ready to do our part, we need instruction.

P. S.—Since writing the above, I have learned from a city teacher, greatly to my surprise and horror, that the "order of exercises" cannot be followed absolutely in the schools of Providence, owing to the same difficulties which opposed it in my own school. I also learn that some complaints have been made against this same plan of the school committee by teachers who declare it to be absurd to expect such concert of action, and who resent it as an infringement of their liberty, as showing a lack of confidence in their judgment. I am still more puzzled than before. If I cannot go to the school committee of Providence for instruction, where shall I go? Can it be that I was right in thinking that the teacher, conscientious and faithful as she ought to be, was the best person to write her "order of exercises" for the day?—*Rhode Island Schoolmaster.*

CONCENTRATION OF POWER ON FEW STUDIES.

One evil, doubtless, in many of our High schools, and certainly in most of our Academies and other private schools, is the pursuit of many studies at once. One cause of this is the limited time that certain pupils can be in school, and the desire of parents that they should possess a "general information" on a variety of subjects. Such parents seem not to know that one valuable acquirement at school, and perhaps the most valuable, is the power rightly to seize and apply the facts of nature

about us, and the "information" which throughout life lies everywhere within our reach.

Another reason urged for having many studies at once, is that the faculties of the human mind are various, and that such a course gives opportunity for their simultaneous development. This reason would have some force, if the opportunity was really given, though even then it might be said that what was gained in variety was lost in power. But most teachers will probably agree that such a division of energies has, in most cases, one of the following results: it either prevents effectual work in any study, in consequence of the dissipation of mental force, or it leads the student to pursue earnestly his favorite one, to the neglect of the others. Where the latter is the case, the evil to the individual pupil is probably not great, though the injury to the classes in the studies he neglects, resulting from the presence and example of the delinquent, may be considerable.

The more general ill effect, however, is the former, *i. e.* the preventing effectual work in any direction. The effort to bring the mind to the point of interest in any study fails, in consequence of the necessity of thrusting this subject aside for another, before the mind has become sufficiently absorbed with it to infuse real energy into the work, or perhaps just when it has become thus absorbed. This results in the gradual destruction of the power of concentration of thought, and consequently the advantages which would come from the right application of this power are never realized. Who can see our youth losing this power of intense and earnest effort, without feeling that it is a matter of exceeding importance that something be done to remedy the evil.

In regard to the number of studies that can profitably be pursued at a time, various circumstances must have influence in determining; but we should say that the cases are very rare where more than two studies besides an art study (music, drawing, or painting) would be well, particularly if these two are the one a Language and the other a Mathematics or a Natural Science. But in these two the lessons should be of sufficient length to embrace enough of the subject to awaken a desire to know more of it, without being so long as to prevent opportunity for reading in connection with it. In the study of Lan-

guages, there should be time for reading works upon their relation to other Languages and upon their literature. Such reading will give zest to study. Biographical reading adds interest to History, and books of Travel are well combined with either Geography or History. Roman Mythology, and all works relating to the habits of life and thought among the Romans, are suitable to be read in connection with the Latin Classics. If one study is a Natural Science, as Botany, for example, there should be time for the pupil to observe and study from Nature herself.

Where there is no art study, it may be well to combine two lighter studies that complement each other, as Geography and History, with a heavy study, like Mathematics or a Language. The special combinations adapted to any school will depend upon the studies to be pursued in the course.

We think the practice of alternating studies (*i. e.* having recitations in different studies alternate days) open to the same objections that apply to having many studies at a time. One case, however, where this might be desirable is where two modern languages, whose grammar has already been thoroughly mastered, are continued with bi-weekly or tri-weekly recitations in the latter part of a course. Again, sometimes a teacher, upon taking a class in Latin Classics, finds his pupils ignorant of Ancient Geography, and therefore makes this study alternate temporarily with the Latin once a week. This may be well in such cases, where the interruption helps bind together rather than disintegrate what has been acquired, as it is in the line of the general principle of not having the mind directed to too many unlike things simultaneously.

Observation and experience both incline us very strongly to the opinion that where the school course embraces many branches, it is far better to take few at once, and complete them, if necessary, in a proportionally shorter space of time, than to have them crowding upon each other in the way they do when many are attempted at a time.

Is there not danger that the frequent change of mental occupation, attendant upon such crowding, may beget in our youth a weakness and fickleness of character which we should all deeply deplore? And is it not possible that some of the loose mental habits we do lament are in part the result of such training?

We are not unaware of the difficulties that lie in the way of determining judicious and satisfactory courses of study; but everything that helps us to a just view of present evils, will be a step towards this end. Parents desire the best good of their children. If they can be convinced wherein it lies, they will not be less eager than we that their sons and daughters should learn in a way that will make their knowledge available; and they will, therefore, welcome any plan that promises to prepare their children to enter active life with minds awake to its work, and so disciplined that their energies can be effectually applied.—*Massachusetts Teacher.*

ÆSTHETICS OF THE SCHOOL ROOM.

DELIA A. LATHROP.

We can readily conceive that man's physical necessities might have been abundantly met without such an overwhelming supply to meet an æsthetic demand. But the Creator has so ordered his work that sky and sea, blade, bud and flower, all animate and inanimate things, sing forth their lesson of beauty unceasingly. Who hath ears to hear them may hear and be made glad. Beauty and use are so co-ordinated and commingled in nature that there is neither inferior or superior. The useful is only then most useful when added to the beautiful; and the beautiful is most beautiful when conjoined to the useful, and with it looking toward a purpose.

It seems the extreme of folly, even though life be "a warfare," "a vale of tears," or "a sea of sorrow," to ignore the existence of so much that is competent to bless and save us in its bitterness. Even a little clay wrought by the hand of the Master is sufficient to open the blindest eyes to the infinite loveliness everywhere. Possibly every teacher may secure the annointing of, and so get such a love for beauty into the deep places of the soul, that she, too, may work miracles, transforming by her plastic touch unsightly and unlovely things into things goodly and to be desired. At any rate, every school room furnishes abundant opportunity to test the ability to do this.

All general efforts are produced by the most careful attention to particulars. No woman of taste takes up her residence in a house without studying the minutiæ of its possibilities. The relation of wall to carpet, of both to furniture, the effects of light and shade, the distribution of ornaments, are all carefully considered. But the same woman, as teacher, does not always use her sense of beauty to make the most of her school-room. The school-house is a shop—a place in which to work, and from which to flee as early as possible. Thus she makes herself the servant of her work. School duty is her antagonism, and it is victor by the ruling of the clock on the wall. As one so puts her soul into her surroundings, as to make them the complement of herself, she makes for herself a place more to be desired than all others. So it is not difficult to see how little skillful labor would make the school-room delightful, and install the teacher mistress of the situation.

There are in every school room possibilities in the arrangement of furniture which may be made use of to produce pleasant effects. The table, the chairs, the stove, the maps and charts, all should be made to contribute to this end. A table spread even with a clean towel or a newspaper, will serve to cover the defects of an old table and make it presentable. Better a clean, whole stool, than never so elegant a chair in dilapidation. In warm weather an ill-looking stove is easily converted into a pretty flower-stand by some forest boughs, or some asparagus, with bouquets and pots of flowers, which the pupils will bring if encouraged to do so. If in winter, some stove polish will make it look new and tidy. The stove of a school room is often the sum of all villainies, æsthetically. It is made the receptacle for bits of apple, pieces of paper, and all the inevitable debris of school. The hearth serves for a spittoon, and the zinc is soiled with ashes, chips, and melting ice and snow. There is no need of such an insult to the good taste of a school.

Teachers may make a great deal of the effects of light and shade in their rooms if they study them. Pupils are made restless; and both children and teacher become irritable by a light too intense glaring upon them. Then, to shade the sunny windows and to open those on shady side, would be to introduce comfort and quiet. Again, on a dark, cold day, to open up the lightest and sunniest side, to get all the sunshine and

warmth possible into the house, is to bring inspiration and joy. *One cannot teach the best school without window curtains or blinds.* The material is not so important as the service they render in adapting the light to the comfort of pupils and teacher. I know a teacher who, in the first school she taught, made hers of newspapers, ornamented at the lower border with devices wrought with scissors, and fastened them up with hammer and nails! Nevertheless, they were good curtains, and helped wonderfully to teach the school.

Much can be done toward making a room pleasant by a skillful seating of pupils. There are harmonies of proportion and color to be observed. A girls' school always seems brighter than a mixed school, and a mixed school brighter than a boys' school. The colors of the dress of girls give warmth to the room in winter, and the light colors of summer give an air of freshness and coolness. The eye requires that the pupils shall be graded from rear to front, according to size. A hap-hazard arrangement in this regard is never satisfactory.

It is fortunate for the school if the teacher writes well. When the boards are kept black and in good condition, the teacher's work is well done upon them, and the pupils are constantly reminded of their duty in this direction. Nothing is more really ornamental in a school-room than a good board covered with well-written work—problems, copies, abstracts of lessons, etc. Much model work of this kind should stand upon the board all the time, that unemployed children may have something to copy upon their slates.

Thus far I have said nothing of ornamentation; but every teacher can do something in this regard. Pretty hanging baskets can be made at absolutely no expense. Pots of flowers and mosses can be had for the taking care of them. The world is full of pretty, cheap pictures. They may be taken from any of the first-class illustrated papers. One who is looking for them will find an abundant supply. Some medium-sized picture frames can be procured, and then by changing the pictures from time to time, the school will always have something new at no expense. One of the most successful primary teachers I know brings every week into her school a new object of interest. It may be a picture, or a hanging basket, or a bracket and vase—it is something which the children enjoy, and in the bringing of

which they see an effort to make them happy. She takes an early opportunity to have a conversation upon it, and then gives it to the school until she has occasion to replace it by some other object of interest. I know another who is constantly planning pretty drawings for her board. She makes a practice of having something new upon the board every Monday morning. Her pupils have learned as they come in to look for the pleasant surprises she prepares for them. Still another has several pictures, which are owned a month each by classes of pupils. A card suspended beneath the picture gives the names of the for-the-time owners. One of them belongs to the pupils who are perfect in attendance for a month; another to the twenty who have stood highest in their lessons for a month, and a third to pupils whose deportment has been without criticism for a specified time. In this way every child has something to work for. One cannot get perfect lessons, perhaps, but can come to school regularly, or can be perfect in conduct. Each child is likely to have a share in one or other of the pictures. If no one earns them they are taken down and put away. So every one is working not only for himself but for the school. In this way the ornaments of the school are made not only silent ministers to happiness, but positive forces in the school-room.

But, after all, the soul of the teacher has greatly to do with the beauty of the school. A light glows in the face of the conscientious, gentle, sympathetic teacher, which illumines all the room with its brightness. In the reflection of her own character she sees in the seats truthfulness, confidence, respect and love. And so the spiritual beauty sanctifies and glorifies all the beauty secured by cleanliness, by arrangement, by ornamentation—by any and every device in material things.—*Ohio Ed. Monthly.*

TOO MUCH THEORY.

MISS FRANK A. TEFFT, SANDY HILL, N. Y.

As a nation, we are given to theorizing—abandoning one speculation only to give place to another. The groaning shelves of the Patent Office at Washington bear incontrovertible testi-

mony to this marked tendency of the American mind. Models beautiful to behold are there, but the superior excellence of many of them exists only in the imagination of their inventor.

Education has by no means escaped. Schemes for reform and improvement from not only earnest lovers of the cause, but from mere theoretical enthusiasts, have been so showered upon us that we are fast becoming submerged in a sea of opinions. Through the columns of educational periodicals, at teachers' associations, from the lips of the theorist, we receive schemes for reform in school government, schemes for improvement in methods, schemes for revised curriculums, until in our attempts to take them all in, we gain almost, or quite, nothing.

Too much credit cannot be given to those earnest teachers whose hypotheses in these matters, having been thoroughly tested by them, become established truths, and are then given to others. The existing excellence of our present school system is due largely to these practical instructors of youth. The mass of theories, however, presented to the educational world has never been tried and proved by those who scatter them broadcast over the land. Of necessity they contain much besides the pure gold. They should be tried in the crucible of the schoolroom—tried by the *true test* of every day experience. As it is, we have no breathing space, no time to select, arrange, prove, and adapt these various views to our particular needs.

Too complex and imperfect machinery is being constantly recommended to us to replace the old; too little practical illustration is added to much of it. It is well to support the claims of the steam-engine over those of the older and slower methods of travel; its superiority is manifest, while at the same time it would be the blindest folly to place the conduct of one of them in the hands of one partially or totally unacquainted with the power of steam or the principles of machinery. Too little care in this matter has already resulted in the loss of thousands of valuable lives and millions of treasure.

Our high schools and academies suffer fearfully from the diverse views held at the present day concerning the course of study proper for them. The superintendency of many, especially in our country towns, is a shifting one. Now in the hands of a devotee of the classics, one of these institutions of learning becomes a seeming center of ancient lore; its halls

resound with the exploits of Greek and Roman heroes. Soon a change comes; the ancient men of valor are forgotten, and the claims of the scientist are acknowledged.

And so it goes—from the classics to science, from science to mathematics, from mathematics to belles-lettres, according to the particular bent of the presiding genius, until the one wonder is that the institution, and all pertaining thereto, do not fly off at a tangent, the love of *liberal* and exact knowledge having become too weak to attract anything to it as a center.

Teachers receive plenty of advice, but very little of it will bear the severe test of every day life. Sometimes we are told that this study occupies too prominent a place in our schools; that, too small; algebra should be studied less; natural science more. Let us be told now *how* to replace the surplus of one by the deficiency of the other. Instead of telling us that natural science should stand more to the front, can we not be informed now how to put and keep it there?

Among the many that excel as teachers of natural science, will not some one, through the columns of our *State Educational Journal*, give us a plain, concise description of the manner in which he enforces its truths upon the minds of his pupils?

Among our superior instructors in mathematics, cannot some be found who are willing and capable of telling *how* they have succeeded in imparting knowledge to those under them—how they have taught them to gain knowledge for themselves, and how to make it useful? In the face of our superior teachers and excellent schools, it is a well known fact that many of our school educated boys and girls fail in their life work; not but what they have taken in enough, but from some lack of mental digestion it has failed to circulate healthily through the system. We may claim that certain studies are in their nature disciplinary, but in their very discipline they reach out into practical results.

And I would not stop here. We do need aid, *illustrated* aid, in our primary schools—less theory and more truths arising from actual experience. I have been frequently told by primary teachers that they had given up reading educational periodicals, ceased assembling with teachers, because they did not receive what they needed. They sought for information con-

cerning their every day work, and were repulsed with theories concerning what *was not*, or what *ought* to be, which they either could not comprehend or were unable to adapt to their peculiar wants. It was asking for bread, and receiving a stone. They were hurried from Kindergartens to object teaching, from the word method to the sentence method, until they retired confused, as were they of old at the time of Babel.

Instead of the repeated tellings of *what* ought to be done, would it not be better to be told *how* to do it, by some one who has actually been successful in the work? Instead of the beautifully worded theories of some college professor concerning the things which pertain to our high schools, or the sonorous advice of the principal of some academy pertaining to the defects of our primary schools, let us have the *actual* experience of those who know whereof they speak. As teachers we need this, and we can have it, provided those who are able to do this work will do it. The Empire State has no need to blush for many of her instructors. She can place them side by side with any, and not fear criticism.—*New York State Educational Journal.*

THE NATIONAL BUREAU OF EDUCATION.

Perhaps few of our readers are acquainted with the purposes and practical workings of the National Bureau of Education. The Bureau was established in order to have some central agency by which the general educational statistics of the country could be collected, preserved, condensed, and properly arranged for distribution. The Act of March 2d, 1867, to which the Bureau owes its being, says that it be established "for the purpose of collecting such statistics and facts as shall show the condition and progress of education in the several States and Territories, and of diffusing such information respecting the organization and management of school systems and methods of teaching as shall aid the people of the United States in the establishment and maintenance of efficient school systems, and otherwise promote the cause of education."

We quote from a pamphlet on "The history, work, and limi-

tations of the National Bureau or Education," by Dr. Alex. Shiras.

"*The collection of information as to the condition and progress of education in the whole United States* is the first branch of the work thus outlined. The field for exploration it presents embraces the thirty-seven States and eleven Territories. To make the exploration thorough, the Bureau must examine every school law, and mark whatever change or amendment may be made, including the charters of city-boards of education with their rules and ordinances. It must sift, for things deserving general attention, the reports of every State, county, and city superintendent of the public schools that may be sent to it. It must get at the work not only of the public high schools, but also of the private academies and special preparatory schools. It must look through the annual catalogues and calendars of a long list of colleges and universities; schools of divinity, law, medicine, and science; reformatories, and institutions for the training of the deaf and dumb, the blind, and the feeble-minded—selecting from each what is worthy to be noted in the way of either improvement or defect. And besides all this, it must keep its eyes wide open to observe the growth of libraries, museums, schools of art or industry, and other aids to the proper training of the people; must see what the educational journals say as to school matters in their several States; must note what may be worth preserving in the utterances at teacher's associations and gatherings of scientific men; and must keep up, with reference to all these things, an incessant correspondence with every portion of the country. In fact, its correspondence reaches, more or less directly, to the forty-eight States and Territories, to 206 cities, 132 normal schools, 144 business colleges, 54 Kindergarten, 1,455 academies, 103 schools especially engaged in preparing pupils for the colleges, 240 institutions for the higher training of young women, 383 colleges and universities, 73 schools of science, 115 of theology, 37 of law, and 98 of medicine; with 585 libraries, 26 art-museums, 53 museums of natural history, 40 institutions for the instruction of deaf mutes, 28 for the blind, 9 for the feeble-minded, 400 for orphans, and 45 for the reformation of misguided youth. The list of institutions in correspondence with the Bureau, already over 4,000, is steadily increasing, and must increase, with the growth of population and schools, to fully 5,000, while that of individual correspondence, now much over 8,000, must soon reach a far greater number. The returns thus made to it, of perfectly free will, on education, exceed considerably what were gathered for the census of 1870 by an army of house-visitant officials, armed with authority for requiring answers to their questions.

"*The 'diffusion' of the information thus collected to 'aid the people in the establishment and maintenance of efficient school-systems, and otherwise promote the cause of education,'* is the second branch of the work to be performed. The language of law, however, here, 'such information as shall aid,' widens the field of research considerably; sends the Bureau to the study of school-systems elsewhere prevalent; and induces inquiry as to the ministries of instruction in the several European States, as to the useful suggestions in foreign educational reports and journals, and as to the systems of training in the universities, gymnasia, real-schools, schools of architecture and drawing, and the various institutions for primary education in every civilized community or State, that whatever is peculiar or excellent in each may be collected, with a view to the assistance of our educators in their work.

"All this with the educational collections from our country, is presented by the Bureau: (1) In the form of annual Reports, each giving abstracts of the various classes of instruction (such as primary, secondary, superior, professional and special), with lists and statistics of all noticeable institutions and estimates of progress or retreat in various lines; (2) in occasional Circulars of Information, of which twenty have been published up to 1875, besides others of a closely kindred character not so designated; and (3) in written answers to inquiries on school-matters addressed to the Commissioner, from a great variety of sources, both in this country and abroad.

"The amount of intelligence conveyed by these means with respect to educational systems, school-laws, and important institutions, is such as has never previously been made generally accessible in the United States; such as no agency belonging merely to a single State could possibly have gathered, and such as private persons could not have obtained without vast labor and a great expense, except through publications thus brought freely within reach."

The report for 1873 is the most valuable report thus far published by the Bureau. To describe even approximately, the mass of information placed before the people, by this report, is out of the question; a glance at the "contents" is all we have space for.

The contents are arranged under five heads. The report of the Commissioner of Education gives the usual introductory remarks, and briefly enumerates the "sources of material," and discusses their availibility. Next we have an exhaustive analysis of the State systems of Public Instruction; of the school-statistics of cities; of Normal Schools; of Commercial

and Business Colleges; of Secondary Instruction; of Preparatory Schools; and of Professional, Scientific and Special Schools; of libraries; of museums of natural history; of the different kinds of asylums; of benefactions to education; of patents for improvement in school furniture, etc.

Of special articles we have three. "Art-education," "On the instruction of deaf-mutes," and "Industrial training for girls, with practical lessons in household economics, as taught in Germany."

The Report would perhaps be more popular reading if an edition were published for general circulation from which all mere statistics are excluded.

IMPORTANCE OF INSECTS.

There is a substance brought from the East Indies, known by the name of lac, which is the produce of a small insect. It deposits its eggs on the leaves and branches of certain trees, and then covers them with a material like gum, intended to protect the eggs and the young. When gathered in this state this material is called stick lac; but it is usually brought to Europe and America in thin, transparent plates, called shell lac, which is the stick lac melted and strained.

Lac is used, in the countries that produce it, in the manufacture of beads, rings, and other female ornaments; but here and in Europe, it is employed in making sealing-wax, varnish and hat bodies. A kind of red dye is also produced from it. About three million pounds of shell lac, and one million pounds of lac dye, are carried into Great Britain every year; about half of which, however, is sent to other countries. A great deal of shell lac also comes to America from the East Indies.

To an insect we are indebted for the coloring matter of that fluid which enables us to record our thoughts and transmit our affections to our absent friends. We mean the fly that produces the gall nut from which ink is made. These nuts are from a quarter of inch to an inch in diameter, and are found on several kinds of oaks.

The insect bores a hole in the leaf and deposits its eggs; this diverts the sap of the leaf from its proper channels, and forms

a sort of web, which increases in size, as also does the young insect inside. When arrived at maturity, the latter eats itself out; hence gall nuts are generally found with a hole in them. The best of them come from Aleppo and Smyrna, and are about the size of a nutmeg. They are also used in preparing some kinds of medicine.

In many diseases it becomes important to raise a blister upon the skin. This is done by applying a plaster made from an insect commonly called the Spanish fly, which is a sort of beetle, of a bright green color, about three quarters of an inch in length. They are most abundant in Italy and Spain.

Our catalogue of insects which are directly beneficial to man, may be concluded by one of the most important and the most interesting of all, and that is the common honey-bee—"the little busy bee" of the poet. Known from the earliest times, and almost everywhere found, it has become the type, or model, of diligence and industry. It is a most faithful little worker, and well deserves its reputation. Diminutive as it is, it has had more books written about it than any other animal, the horse and ox perhaps excepted.

The bee is of great value to us. Unlike the silk-worm, it does not require to be fed and taken care of; but it earns its own living, and asks nothing at the hands of man. It takes that which is not missed; and the flower it has rifled loses nothing of its fragrance or beauty. It gives us honey, which is a most delicious article of food; and wax, which is employed for various purposes. There is hardly any part of the world, within the torrid and temperate zones, in which the bee is not found, either in a wild or a domesticated state. It is abundant in our western forests, and its honey is gathered by men called bee-hunters, who show great sagacity in finding where it is stored.

The actual value in money of the products of bees is very great, but can hardly be estimated. In Europe, many cottagers and small farmers derive no small part of the support of their families from their bee-hives. In Great Britain alone about six hundred thousand dollars are spent for foreign honey, besides what is made at home, and about the same sum for foreign wax. The wax and honey produced in the United States during the year 1850 were upwards of two millions three hundred and

seventy-six thousands dollars in value. Such is the wealth created by a little brown creature, which we can hardly see as it wings its flight through the air.

TECHNICAL GRAMMAR.

There is a rebellion rising in the Eastern States against the study of technical grammar in the public schools, which promises to issue in a real reform. It has long been questioned by thoughtful educators whether any good purpose was served by the teaching of elaborate and perplexing grammatical rules, and at last a practical experiment has been made to test the matter. In Cincinnati two divisions of pupils, equally advanced in their studies, but one of which had been trained in technical grammar, while the other had studied it only through reading, were set to write compositions. The result fully confirmed the anticipations of those who disbelieved in the utility of the study, for the pupils who had studied grammar only incidentally made no more blunders than those who had been trained in the text-books, and, moreover, wrote in a much better style. This is a tolerably fair demonstration of the value of technical grammar, but perhaps a still more convincing test will be for any intelligent man or woman to take up a grammar text-book, and endeavor to grasp the rules laid down. Having in this way obtained a realizing sense of the nature of the task, let them try to put themselves in the place of the children. A quarter of a century ago it was common in the English Schools to teach Latin with a grammar written altogether in that language. The student, in fact, had to learn the very grammatical rules of a language with which he was unacquainted, through the medium of the language itself. Naturally the amount of Latin grammar thus assimilated was not great, and those who actually mastered the language did so for the most part by familiarizing themselves with the writings of standard Latin authors. The modern English grammars, however, are scarcely less incomprehensible to the youthful intellect than were the Latin text-books referred to, and we very much doubt if a child ever does or can learn to write or speak English correctly

through technical instruction of this kind. That a pure and easy style may be attained by the constant perusal of English classics, we have no doubt at all; in fact Johnson distinctly recognized this method when he wrote "whoever wishes to attain an English style, familiar but not coarse, and elegant but not ostentatious, must give his days and nights to the volumes of Addison." We believe that the most common effect of training in technical grammar is to inculcate an absolute distaste for English literature, which not seldom long outlasts the educational period. Certainly no training of this kind can impart that purity of literary taste which leads to the rejection of trashy reading. On the other hand, this technical instruction may proceed, *pari passu*, with an outside education in sensational literature of the most rubbishy order, and thus by the time the pupil has mastered the grammatical rules, his taste may have become so vitiated that he cannot apply them with any useful results. It is, we think, capable of demonstration that not one person in fifty who has passed through the public schools retains at manhood any useful recollection of his grammatical studies, and how little effect they have upon after life is abundantly shown by the slipshod grammar which is hourly encountered, alike in conversation and in correspondence. All things considered, there is good ground for protest against the continuance of this branch of education, and if ever public opinion is strong enough to overcome the influence of the grammar manufacturers and publishers, perhaps the time now wasted upon it in the schools will be utilized in teaching something of practical value.—*Sacramento Record-Union.*

AXIOMATIC TRUTHS OF METHODOLOGY.

1. The method of nature is the archetype of all methods, and especially of the method of learning languages.

2. The classification of the objects of study should mark out to teacher and learner their respective spheres of action.

3. The ultimate objects of the study thould always be kept in view, that the end be not forgotten in pursuit of the means.

4. The means ought to be consistent with the end.

5. Example and practice are more efficient than precept and theory.

6. Only one thing should be taught at one time; and an accumulation of difficulties should be avoided, especially in the beginning of the study.

7. Instruction should proceed from the known to the unknown; from the simple to the complex; from concrete to abstract notions; from analysis to synthesis.

8. The mind should be impressed with the idea, before it takes cognizance of the sign that represents it.

9. The development of the intellectual powers is more important than the acquisition of knowledge; each should be made auxiliary to the other.

10. All the faculties should be equally exercised, and exercised in any way consistent with the exigencies of active life.

11. The protracted exercise of the faculties is injurious; a change of occupation renews the energy of their action.

12. No exercise should be so difficult as to discourage exertion, nor so easy as to render it unnecessary; attention is secured by making study interesting.

13. First impressions and early habits are the most important, because they are the most enduring.

14. What the learner discovers by mental exertion is better known than what is told him.

15. Learners should not do with their instructor what they can do by themselves, that they may have time to do with him what they cannot do by themselves.

16. The monitorial principle multiplies the benefits of public instruction. By teaching we learn.

17. The more concentrated is the professor's teaching, the more comprehensive and efficient his instruction.

18 In a class, the time must be so employed that no learner shall be idle, and the business so contrived that learners of different degrees of advancement shall receive equal advantage from the instructor.

19. Repetition must mature into a habit what the learner wishes to remember.

20. Young persons should be taught only what they are capable of clearly understanding, and what may be useful to them in after life. [*Marcel on Language*, quoted in Quirk's *Essays on Educational Reformers.*

THE CART BEFORE THE HORSE.

The parent who expects his son to turn out a truthful and honorable man, while he himself sets that son an example which is anything but truthful and honorable, will almost certainly find himself bitterly disappointed; and he who hopes that his children will acquire the intelligence which will fit them for a respectable career, the integrity which sustains them in it, or those agreable manners which will smooth their way in life, while he allows them to associate with the common blackguards of the street, will discover, when too late, that he has made a radical mistake in his calculations, and that such results will not come of such causes; that such ends cannot be attained by the use of such means.

There is entirely too great a disposition on the part of the public to shift all responsibility from the individual to the state. Good laws are supposed to be the only requisite for the development of a good national character; and, to make a particular application of the general principle, it seems to be thought that the whole responsibility of educating a community rests upon those whose official duty is to fulfill certain functions connected with the common schools and private Seminaries.

But this is a disastrous mistake, and the sooner parents or guardians come to see and feel that they themselves have important duties to perform in conjunction with school directors, trustees and teachers, the better will it be for the commonwealth.

Character is developed chiefly *in the family*, and although judicious legislators, superintendents and teachers may do much towards remedying defects resulting fron bad home management, nevertheless, if parents neglect *their* duties such functionaries can accomplish comparatively little of what they design.

To expect the formation of a noble character outside of the home, where it should begin, and, in the main, be carried on, is certainly to "put the cart before the horse."

THE normal schools of the country supply only 4,000 trained teachers per annum, while the annual deficiency is estimated by the Bureau of Education at over 125,000.

DEPARTMENT OF PUBLIC INSTRUCTION.

WE call the attention of County Superintendents and Trustees to Section 1621, in which it is provided that the school moneys received from the State and county apportionments must be used exclusively for the support of schools for that school year, until at least an *eight* months' school shall have been maintained; and not until school has been maintained for this length of time can a balance be left in the treasury with which to pay, at the end of the school year, outstanding claims against the district. It seems to have been held by some that, after a six months' school has been maintained, a balance might be left in the treasury with which to pay outstanding claims. To do so would be in direct violation of law.

IF, in accordance with the provisions of Section 1582, the County Superintendent orders a census to be taken in order to ascertain the ratio in which the funds must be divided between the old district and the new district set off from it, a census should be taken in both the old and the new district, and not in the latter only. The reason for this is obvious. The legal ballot paper need not be used in elections for trustees, but *must* be used in all elections for voting a tax.

FURTHER on we give in full, the decision of the Supreme Court in the text-book case. According to this decision, the adoption of the Pacific Coast Series of Readers in place of the McGuffey's Series, and Cornell's Primary and Physical Geographies in place of the Monteith's Series of Geographies is declared null and void. From the minutes of the proceedings of the State Board of Education, it does not appear that any text-books in writing were ever adopted by the Board. On January 9th, 1875, the Board for the first time adopted text-books in this study—the Spencerian copy-books—and the adoption of these books does not seem to be touched by the decision of the Supreme Court.

THE attention of school officers is once more drawn to the matter of taking the school census in June. Boards of Trustees must appoint the Census Marshal on or before the first of June; the Census Marshal must take the census during the month of June, and finish his report in time so that it will be in the hands of the County Superintendent on or before the first of July. County Superintendents should, on the first of July, ascertain which districts have not sent in their reports, and immediately notifiy the trustees. The County Superintendents' report of census statistics is due at this office on or before the first of August; and no days of grace can be allowed. After a report is filed with us, no alteration or correction can be made in it, except such as result from clerical mistakes on the part of the County Superintendent.

WE hereby notifiy teachers that their annual reports must be filed with the County Superintendent on or before the 10th of July. We fix the 10th of August as the date on or before which the County Superintendent's "Report of the condition of the common schools" must be on file in this office. The penalty provided for by law will be promptly and strictly enforced in every case of delinquency.

The report *must* be in our hands by the 10th of August, as our biennial report can not be begun until *all* the data to be furnished by the different school officers, are received.

DECISION IN THE TEXT BOOK CASE.

ON the 19th of April, the Supreme Court rendered a decision in the case of the People ex rel. Bellmer vs. The State Board of Education, affirming the judgment of the Sixth District Court in the premises. The decision was written by Chief Justice Wallace, all the other Justices concurring. It reads as follows:

"The Act of April 4, 1870, contains the following provisions: 'Any book once adopted in the State series shall be continued in use for a period not less than four years.' The Political Code, as originally adopted, contains the following provision: 'Section 1874. Any books once adopted as part of a uniform series must be continued in use for not less than four years.' It is apparent that the provision of the Code last recited is substantially the same as the provision found in the Act of April 4, 1870, and under the rule of construction prescribed by the fifth section of the Political Code, Section 1874 of that Code, is a continuation of Section 88 of the Act of 1870. It is, in fact, a mere repetition of Section 88 of that Act, in reference to the use of books under the established system of public instruction administered through the agency of common schools. Neither the Act nor the Code permitted the discontinuance of an adopted series of books until such series had been in use for the period of four years, and neither of them prescibed the procedure by which, even after the lapse of that time, the adopted series might be authoritatively changed. This defect was remedied by the amendment of Section 1874 of the Code, by which six months' notice of any proposed change was required to be given. The authority of the Board to effect the change was thereby made dependent upon the giving of the prescribed notice, and its exercise was forbidden, except after such notice was first given. It is not seriously claimed that any notice of the attempted change in question was ever given, or attempted to be given, upon the part of the Board; certainly the circumstance that the proceedings of the Board, in which their intention to effect the change was declared, subsequently appeared in the columns of a newspaper as a mere matter of public interest could not be claimed to amount to efficient notice given by authority of the Board, pursuant to the provisions of the Statute in that behalf. It results that the judgment of the Court below must be affirmed, and it is so ordered."

EDUCATIONAL ITEMS.

CALIFORNA.

PRESIDENT GILMAN left for the East on the 28th of April.

ON the 10th of April, Los Angeles voted a tax of $10,000 for a new school-house. The vote was nearly unanimous for the tax.

THE Pescardero school-house, we are informed, is one of the finest public buildings in the county. When completed, it will cost $3,800.

OROVILLE School District, Butte County, voted to levy a tax sufficient to raise the sum of $3,500 to build additional school buildings.

PROF. BREWER, of the Sheffield Scientific School, who gave a course of lectures at the State University, left for the East on the 28th ultimo.

THE Normal School Trustees elected Professor H. B. Norton, of the Normal School of Kansas, as an assistant teacher for one year, at a salary of $2,000.

THE Fairfield Grammar School has organized a society under the style of the "Excelsior Literary Society," with Miss Jennie Lemon as President, Jno. M. Wood, Vice-President, and Jennie Jones, Secretary.

PROFESSOR C. H. ALLEN, in his report to the Normal School Board of Trustees, suggests that the time for completing the State Normal School course be increased to three years, as the time now allowed is hardly sufficient.

FEMALE CANDIDATE.—Mrs. J. M. Woodman, of Chico, is a candidate for Superintendent of Public Instruction of Butte county, at the request of many citizens, and the *Enterprise* says she is qualified for and worthy of the office.

WASHINGTON Corners and Haywards are indulging in new school houses. The former district is erecting a fine two story, four-room frame building, to cost about $3,500. The Haywards building is also two-stories, with four rooms, and the estimated cost is about $5,000.

SCHOOOL TO BE OPENED.—The buildings erected for the temporary use of the deaf and dumb and blind having been completed, the schools were opened on Wednesday, the 21st instant. As the accommodations are limited it will be necessary to enforce the rules concerning the admission of pupils, and those who are not present at the opening will run the risk of losing their places in the school. There will be no further vacation till June, 1876, save at the Christmas holidays.

ST. LOUIS, March 22d. 1875.

THE officers and counselors of the National Educational Association have decided by a vote of thirty-two to fourteen to hold the next meeting in Minneapolis, Minn. Ample arrangements will be made by local committees to provide for the entertainment of members and for excursion rates by the lakes and railroads and by the river. A circular will soon be issued giving particulars as to routes and accommodations as well as the programme of the proceedings. The time fixed for the meeting is August 3d, 4th. and 5th, 1875.

W. T. HARRIS, President Nat. Ed. Association.

NEWSPAPERS AS EDUCATORS.—A school-teacher of our acquaintance who has had the benefit of long practice of his profession, and has watched closely the influence of a newspaper upon a family of children, gives as a result of his observations that, without exception, those scholars, of both sexes, of all ages, who have access to newspapers at home, when compared with those who do not, are:

1. Better readers, excelling in pronunciation, and consequently read more understandingly.
2. They are better spellers and define words with ease and accuracy.
3. They obtain a partial knowledge of geography in almost half the time it requires others, as the newspaper has made them familiar with the location of important places and nations, their governments and doings.
4. They are better grammarians, for, having become familiar with every variety of style in the newspaper, from commonplace advertisements to the finished and classical oration of the statesman, they more readily comprehend the meaning of the text, and consequently analyze its construction with accuracy.—*Golden Era.*

THE University of California, with the generous co-operation of Rail Road engineers, and others practically interested in the investigations, proposes to make a thorough examination of the timbers grown and used on the Pacific Coast —especially for the purpose of ascertaining their strength, durability, and adaptation to various industrial, engineering, architectural, mechanical and manu-

facturing purposes. The result of these investigations will be reported to the Legislature and published for the benefit of the people in this State and at a distance. The suggestions and co-operation of scientific and practical men will be greatly appreciated. By the agency of the C. P. R. R. Co., S. P. R. R. Co., and Wells, Fargo & Co., specimens will be collected and brought to the University. The mechanical tests will be made by F. G. Hesse, Oakland, Professor of Industrial Mechanics, and he will be assisted in other departments of the investigation by the professors of Botany, Agriculture, Chemistry, Physics, and Engineering. In connection with this work, the collections of the University in Economic Botany and Vegetation will be increased. Interesting specimens for the Museum are solicited. Communications on the subject may be addressed to the Secretary of the University.

BOOK NOTICES.

THE ECLECTIC HISTORICAL ATLAS. A Handbook for Students and General Readers. Cincinnati: Wilson, Hinkle & Co. Price, $1.50.

In noticing Miss Thalheimer's *Mediæval and Modern History*, we drew attention to the excellent maps, which form so seviceable a feature of that excellent manual, as well as of the *Manual of Ancient History*, by the same authoress. The maps of these two manuals are published separately in the Atlas before us, and form a useful historical hand-atlas for all who cannot afford Spruner's Atlas.

SCHOOL FESTIVAL SONGS. Dayton, O: J. Fisher & Bro. Price, 75 cents.

This book presents a collection of thirteen pieces of favorite English and German trios and choruses, for male or female voices, with piano accompaniment. The pieces are suitable for exhibitions, commencements, concerts, and parlor entertainments.

A FREE LANCE IN THE FIELD OF LIFE AND LETTERS. By William Cleaver Wilkinson. New York: Albert Mason. San Francisco: A. Roman & Co.

Under this rather "belligerent" title, we have eight essays on "The Literary and the Ethical Quality of George Eliot's Novels," Mr. Lowell's "Poetry," "Cathedral," and "Prose," Mr. Bryant's "Poetry" and "Iliad," "The History of the Christian Commission as a part of Church History," and "The Character and the Literary Influence of Erasmus."

The essays contain some of the most genial and thorough criticisms we have lately read. The essay on "Mr. Lowell's Prose" will prove interesting to all students of grammar, composition and rhetoric.

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These two readers are undoubtedly *model* readers, and the best American primary readers we have seen. Their characteristic features are colored illustrations, and well digested instructions to teachers. The "Hints to Teachers" in the First Reader, will be of great value to primary teachers. The Second Reader, in the "Introduction" gives considerable instruction in regard to what is necessary to good reading, and how to drill the pupils.

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Mr. Hotze is very favorably known as the author of "First Lessons in Physics." In his new work, the author has well sustained his reputation; the conciseness, simplicity and practibility of the "First Lessons in Physiology," entitle the book to take a front rank among the elementary text-books on physiology.

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GETTING A DOCTOR'S DEGREE IN GERMANY.

[The following extracts from a private letter will, we believe, be found to have a general interest:]

HEIDELBERG, March 6, 1875.

* * * I suppose my postal-card reached you a day or two since. I ought to have written you at length before this, but my nerves are rather unstrung after the excitement through which I have passed, and I have been exposed to a perfect flood of invitations from all sides.

Now, as this is going to be a "doctorial" letter, I must give you a little account of how the degree is obtained in Germany, and what it denotes. The right to bestow the doctor's degree belongs to all of the twenty-two German Universities. The degree of D.D. is honorary, and is bestowed only on eminent theologians. The degrees of M.D., LL.D. and Ph.D. are, however, only gained by passing severe examinations; and, with one or two exceptions, the universities guard the honor of the degree very jealously. It is the only door through which one can gain admittance to a professor's chair at the universities. In the philosophical faculty at Heidelberg, there are five grades to the degree, denoted on the diploma respectively by the words, 1°, summa cum laude; 2°, insigni cum laude; 3°, multa cum laude; 4°, cum laude; 5° (without any designation); or in English: 1°, with the highest praise; 2°, with distinguished praise; 3°, with much praise; 4°, with praise; 5°, with-

out any praise to speak of. The first degree is very rarely gained; perhaps one out of ten among the German doctors obtains it, but only after many years of work. Most of the German scientific students are very happy if after several years' residence at the university they can boast of a second degree, and a great many have to be satisfied with a lower mark. The candidates for Ph. D. have to select for their examination a principal subject in which they are supposed to be thoroughly versed, and two other departments of knowledge in which such an intimate familiarity is not required. An examination in classics must also be passed, as the degree of M. A. is bestowed at the same time. Not long after the commencement of my student-life here, I saw that it would be of great advantage to me in my scientific life to possess such a rank, which has recognized worth in all the world and is not obtained by friendship or favoritism, as is so often the case in America. So I directed my studies in such a manner as would be of the most advantage to me in this project, although it seemed very doubtful whether I could ever reach such a point that I would dare to face an examination in a foreign tongue. (The privilege granted to candidates of performing the examination in Latin is unfortunately not of much use.)

Last November, I made up my mind that the ordeal must be passed before the Kirchoff left the university. I did not write of my determination, because I had constantly before my eyes the dread of "falling through," as the Germans term a failure to pass—a fate which more than one of my friends has met with during the past year, and which set one of them nearly crazy. For the same reason I did not tell my most intimate friends here, as I did not wish to have their anxieties aroused any more than yours. My friend H—— set out with the same object in view, and we studied together. My principal subject of course was chemistry, and the secondary subjects were physics and mineralogy, which are themselves so necessary to the chemist. Of the authors I have read, and the amount of knowledge that I managed to cram into a head of unusually small size, I cannot give you much of an idea. Since Christmas I have read between 25,000 and 30,000 pages. By the 1st of February, Dr. Brown's document reached me, and you can understand now why I was so anxious for it. I now summoned

up my courage and prepared to announce myself as a candidate. I wrote in German an appeal to the faculty that they would permit me to appear as a candidate. Then in the most classical Latin at my command I drew up my autobiography, giving a full account of my education to the time when "I entered the walls of my Alma Mater Heidelberg and enjoyed the opportunities of listening to its eloquent and learned professors." Fortified with these documents, with my pass, my certificate that I was an A.B., and a Hamilton College catalogue containing the record of my honors and prizes there, I paid a visit to the dean of our faculty, Dr. Weil, professor of Turkish, Arabic, Syriac, etc. He received me very kindly and read my papers with great satisfaction. I told him that I wished to escape the classical examination, as my acquirements in German were confined principally to scientific subjects, and it would be excessively difficult for me to translate from a foreign language into German. My previous classical studies in English had extended, besides, far beyond what was necessary for the examination here. He pulled down some old musty author whom I had never seen before, and let me translate a passage. I rendered it quite easily—although I am a little rusty in Latin—being bothered only by one passage, in which the Professor himself was stuck. He was quite pleased with the result of the test, and told me to come next day. That evening he laid my papers before the faculty. They granted my petition, and, further, the philologs decided that a classical examination was quite superfluous in my case. About a week later the head-beadle appeared, and announced that the philosophical faculty desired the pleasure of my company at 6 P. M., on the 3d of March. My Sandwich Island friend H—— went through the same ceremonies and had the 2d assigned as his day of execution. He had passed only two years at Cornell, however, and had not received his degree, so that he was not freed from the classical examination. His father is German, and he has been a year longer here than I, so that it was not so difficult for him. Things now began to look serious. Neither of us had any hope of obtaining a high rank, but we had the greatest fear of failing and the consequent disgrace. I was quite disgusted with myself to find how perfectly the whole affair had taken control of me. I thought I had grown too old to be affected by such

things. But there was such a dreadful uncertainty. To be examined by the most renowned chemist and the most renowned physicist in all Europe, and, further, to be examined in a language which I had only practiced for a little over a year, altogether made me feel rather shaky. My sleep was disturbed by ugly dreams of coming failure, and often it was utterly impossible for me to concentrate my attention on the book before me. The days and weeks flew by with leaden wings. It seemed as if I could not bear the suspense until my doom was decided. H—— was equally excited, and we counted the days and hours until we could be certain of our fate. At last the day before my examination came. At noon I was to visit the various professors who were to examine me, and give them a formal invitation to the ceremonies. Attired in a regulation suit of black, with swallow-tail, white tie, stove-pipe, and white kids, I paid my visits. I felt just about as comfortable as if I was in a coffin. The professors received me very cordially, and I had pleasant little chats with them. Bunsen rushed out of the laboratory, met me in the hall, and, as is his custom with all candidates, said that as I had other visits to make he would not detain me, and then dodged back again. That evening H—— passed nicely, and that took a load off my mind, especially when it was announced the next morning that he had obtained the highest degree. I thought then that surely I could pass, although a "first" would never be my lot, for he had studied a year longer than I at the university. After the first outburst of joy over his success, I felt jealous for about five minutes, as I thought that we could not win the same rank —something we had both wished for very much. But I soon overcame that feeling. I ate a light dinner, and afterwards did not try to do much studying--following a very earnest injunction of Prof. Kopp.

At three o'clock, C—— and "Dr." H—— took me off for a long walk, keeping up a lively conversation and not allowing my thoughts to run upon the fast approaching ordeal. At five we returned; after a little rest, I got into my costume again. Despite my friends' endeavors, I was in a state of most intense excitement. They escorted me to the Senate Chamber, and, with many a parting word of encouragement, greeted me for the last time as a student.

I was received by the beadle in the prorector's office, a sort of ante-room. One after another the professors dropped in, deposited their coverings, and disappeared in the room beyond. I paced up and down nervously, smoothing the wrinkles out of my gloves. Finally, Bunsen rushed in, gave me a little nod, threw off his large fur mantle, and dodged into the next room. That was the signal for the tortures to commence. The dean appeared at the door and requested me to enter. Before I was directed to a vacant chair, I had time to cast a hasty glance about the Senate Chamber. It is the scene of the faculty deliberations; a comfortably-sized room, tastefully decorated with pictures and busts of eminent personages in the history of the university. In the center is a long, green table. About this were grouped the professors in luxurious arm-chairs, the dean sitting at the head. By the side of Bunsen was an empty chair—for the victim; and on the table in front lay paper and pencil. I took my seat rather awkwardly, feeling a little scared and lonesome amidst all these grave and dignified professors. Bunsen sat for a minute without uttering a word, while I made a vain endeavor to look happy and unconcerned; then he suddenly turned around and asked me to give the oxygen compounds of arsenic. As soon as the word arsenic left his lips, I forgot my excitement, and was at once cool and collected. He had started on a subject where I was perfectly at home. Then followed question after question, nearly all of which I answered quite correctly. I made two mistakes of a very unimportant character. Bunsen examined me in analytical and inorganic chemistry, and after I had given an account of a delicate reaction for arsenious acid which he had discovered himself, looked very happy and satisfied, and gave up his seat to Prof. Kopp. His department was theoretical and organic chemistry, and he started off with oxalic acid, from which he branched off into quite a variety of subjects. I wrote down all the formulas he wished, answered his questions promptly and correctly, and when he rose could scarcely believe that the first hour of the examination was past.

A recess of ten minutes now ensued. On a side-table were several bottles of wine and plates of cakes. The dean and Kopp urged me to take a glass of wine with them, but I contented myself with a few sips of water and a macaroon. I now

had an opportunity to study the faces of the professors better as they made a more vigorous onslaught on the provisions. There was Stark, the prorector, a little old man with kindly features, one of the most noted archæologists in Europe; Pagstecher, the professor of anatomy and zoology, looking so thin that I concluded he must use himself as a specimen in his lecture-room; Baron Reichlin-Meldegg, noted for his lectures on Faust and for the invariable readiness he shows at doctors' examinations to assist in clearing off the refreshment-table. His reputation in the latter direction, as I can well testify, is based on good foundation. Then there were a number of others famed in this or that branch of science, and last but not least, my four examiners, who together form a quartette which no other university in the Fatherland can equal, but which has now lost one of its brightest lights by the departure of Kirchoff. After a little chat with Reichlin-Meldegg, who showed a great interest in the American methods of eating and drinking, and told me of what a good dinner they were going to have next Sunday in honor of Kirchoff's departure, I noticed that the professors had emptied the bottles and were resuming their seats. I noticed also that there was a secretary present, who took down all my answers, to refer to in case of disagreement among the professors at the final decision.

Prof. Blum now sat down by me and questioned me in mineralogy. I was troubled somewhat in my language while trying to answer questions in crystallography, and did not make a particularly brilliant show. Finally came Kirchoff, who ran rapidly through the theories of light and electricity with me, and at eight relinquished his seat. Then the dean requested me to step into the ante-room. I was there but a few seconds when I was summoned back. The faculty were all standing up facing me. At their head was the dean, who delivered a short oration, announcing that they had decided to confer upon me the degrees of M.A. and Ph.D., and that I was to appear the next morning at eleven. The professors bowed low; I bowed lower still and retired, feeling that at last I could breath freely. I hurried on my overcoat and stepped into the hall, where a crowd of my student friends, representing every quarter of the globe, were waiting to congratulate me. The hand-shaking was scarcely finished before the professors began to appear,

showing that it had not required much time to decide on the rank I should assume. We had to scatter, and went out to see Mrs. H——, who was awaiting in great anxiety the result of the examination. She gave me a comical picture of how her husband acted when he learned that his boy had come through all right. He was so excited that he had to take off his coat and dance around the parlor. I was weary and faint, and sought in vain to sleep after reaching my room. I had made several mistakes in my examination, and had not expressed myself very well, and finally came to the conclusion that either the second or third degrees would be assigned to me. It was better than I had hoped, and on that decision I went to sleep.

The next morning at nine I went round to H——'s room. As soon as I entered, he threw his arms around me and exclaimed, "You've got *summa cum laude!*" I would not believe him; but there was the beadle, who had brought his diploma, and he confirmed the news. The announcement seemed to take away my strength, and I had to sit down. It is an honor that no German scientific student for eight months has gained, and, best of all, my friend and I had the same rank, which made us very happy. Then we went to Bunsen's lecture, and at its close I had to receive congratulations from all sides, the American students being specially jubilant, for the traditions give no record of any American having won the first degree before. At eleven I presented myself again at the Senate Chamber, as before, in evening costume. The dean and secretary in similar dress stood before me, on one side the two beadles with silver maces. The secretary read off a long premise in Latin; at its conclusion the beadles crossed the maces before me, and, resting the first three fingers of my right hand on them, I replied, "Confirmo et polliceor, sic me Deus adjuvet." The dean then read off more Latin and congratulated me very warmly on the honor I had obtained, telling me that the faculty were unanimous in the decision. The beadle brought me my diploma the next morning, with about twenty-five copies on thin paper, which I have used, in the regular German fashion, to inform my friends of the event.—*The Nation*, *May* 20, 1875.

FRED IS BANISHED.

By Adam Stwin.

Fred studied too hard last winter: partly because he was ambitious to stand well in his classes, partly because the long, cold season made it impossible for him to run about much and amuse himself out of doors; but chiefly, I think, because he really liked to study. The effect was bad. He lost his appetite, and grew thin and nervous. His sleep was troubled at night. His head ached every day, and he became so anxious about his studies that his father and mother had to interfere. They tried to get him to drop some of his studies, but he would not, for his classmates would then get ahead of him. Finally the family doctor was called, a wise old man, who gave him—what do you think? Nothing at all! But he gave Fred's parents such a scolding that they were ready to cry.

"You are killing the boy," he said, "you and the schoolmaster. Take him out of school immediately."

"That would only fret him the more," said Fred's father. "His heart is so set on his studies that he wont listen to reason."

"Then send him into the country," said the doctor. "Take his books away from him, and insist on his spending the most of his time out of doors. He'll find enough to think about in a little while."

"Isn't it too early in the season?" his mother asked, seeing how Fred winced at the sentence of banishment.

"Rather early," said the doctor; "but by summer it will be too late—unless you want to send him in a coffin."

The doctor's plain talk carried the day. Fred begged for delay: a month or two later and he would not object; but to leave school in the midst of the term, when the country was but a dreary waste of melting snow and mud, and be compelled to do nothing while his classmates went on with their studies—that was a cross indeed!

It was a question of life and death, however; so in spite of his remonstrances poor Fred was packed off to this Connecticut farm-house to wait for the buds and birds to make the country endurable.

"If I only could have brought my books," Fred complained to me shortly after his arrival, "I could have kept up with my classes. It's just a waste of time to be moping around here with nothing to read and nothing to see and nothing to do."

"You might begin to study the country," I suggested."

"Study!" he replied petulantly. "What is there to study here?"

"All out doors," I replied; "enough to keep you busy more than one summer."

"I don't see it," said he in school-boy phrase. "Not a mountain; not a river; not a lake; nothing in sight but a lot of rocky hummocks for hills, a few puddles for lakes, and a peat swamp! It's the stupidest place I ever saw."

"The country is never stupid," I said, "to people who keep their senses awake."

"Just tell me one thing worth looking at," grumbled Fred.

"When I came from the post-office this morning I noticed a very interesting stream of water. You told me, I think, that when you left school you were studying Rivers in your physical geography. I don't believe that your classmates have half as good a chance for studying river effects as you have here."

"Really?" he asked, brightening a little.

"Truly," I replied.

"Where is it? I didn't notice any such stream when I came out here."

"It wasn't running then; now it comes down the lane and and crosses the road, a little below the barn. Suppose you slip on your rubber boots and take a look at it."

It was a charming day for the season—at least, overhead. The sun shone so warm and spring-like that one almost forgot the snow-drifts in the fence-corners and the little torrents that ran from them, making the roads impassable for the mud. It will do Fred good to get out a little, I thought, as he set off quite elated at the prospect of something to see and something to learn.

In a few moments he came back, looking strangely indifferent, almost sulky.

"Well," I asked, seeing that he had nothing to say; "what did you observe?"

"I observed it was the first of April."

This with freezing dignity. I began to laugh, but he was plainly so put out that I stopped, and assured him that I had no intention of sending him on a fool's errand.

"I went one all the same," he replied, glumly. "You don't pretend to say there is anything to be learned from a mud-puddle like that, do you?"

"I thought it very suggestive, to say the least, when I saw it this morning."

"What is the use of teasing a fellow? It's bad enough to be sent off to this dull place, to waste my time, without being laughed at."

Poor Fred! He was so out of sorts that he could see only the dark sides of everything. It was his general debility, I suppose; for in health, Fred is as amiable a boy as you could ask to see.

"Come," I said, "slip on your boots again, and we will take a look at the puddle together. I'm afraid you have not been used to find information in such humble places."

"No indeed," he replied earnestly.

And when I went on to say that the lowliest places have instruction for who ever will honestly seek it, he gave me a look half suspicious and half contemptous; for he thought I was talking nonsense, and could not tell whether I was joking or in earnest.

We soon came to the stream—a little runlet of snow-water that sparkled down a grassy slope and got sadly fouled in crossing the highway, where it formed a nasty mud-hole, escaping at last into a pool perhaps ten feet long and half as wide. We stopped at the point where the stream poured its little torrent into the puddle, as Fred had called it.

"Don't you see anything worth noticing," I said, as Fred stood and looked at his mud-daubed boots.

"No," he replied, glancing at the stream; "unless it is the color of the water. What makes it look so curdly?"

"Let us see," I replied. Then we followed up thes tream to where a little clear rill from a snow-bank by the road-side joined the coffee-colored stream from the road.

"Isn,t it curious!" Fred remarked. "See how the two

streams run together without mixing. Is that the way it is in the Mississippi River?"

"What do you refer to," I asked.

"'Why,' said Fred, "I have read that the Mississippi is a clear watered stream, and the Missouri very muddy, and when they come together their waters do not mix for a long time; that many miles down the river there will sometimes be spaces of perfectly clear water in the midst of the muddy water."

"You see how such a thing could be, now, don't you?"

"Of course; it's as plain as day. I never believed it possibly before."

"Does anything else in this muddy stream suggest any other river you have read about?"

"The Missouri is said to be very muddy, and very swift and shallow in many parts, like this. I have read that its channel shifts rapidly, and sometimes a river town will suddenly find itself a mile from the main stream."

"By watching this little stream awhile," said I, "you will see just how such changes occur. See how it is cutting into that bluff bank there, and what a stream of sand runs along the bottom, filling up deep holes where the current is slow. Here's a sand-bar, pushing out from this point. Here a half-buried leaf turns the current to one side, gives it a whirl, and sets it boring out a deep cut through this shallow space. Here you see a furious ripple on this broad flat bar; a boatman would take that as a sign of danger. Here a tuft of grass makes an island, with a long tail of mud stretching down the stream. Here a strip of hard ground makes a rapid. Here at this bend or loop, the current, which has been hugging the off shore so long, strikes against this stony point, and hurries straight across to the neck of the loop, which it is rapidly cutting away. Worn on both sides, the neck will not last long; then the channel will take the short cut and leave the curve to form a slough or lagoon, such as you see represented on large maps of the Mississippi, marking old river courses. In a little stream like this you can watch all these changes going on at once—islands are formed and worn away—deep places are filled and shallow places dug out—all the operations, in short, that give character to rivers like the Mis-

souri, the Rio Grande, the Parana, the Yangtse Kiang, and others of the sort. This quiet, clear stream, fed by the melting snow, and running over a hard bottom, will teach us the character of another large class of rivers, like the Hudson, for instance, or the Susquehanna."

"Isn't it wonderful!" Fred exclaimed, fairly excited by the revelations of river habits the little streams afforded. "Is that a delta, there where the stream runs into the puddle? What makes the mouth spread out so like a fan?"

"The very same causes which make the Nile and the Ganges and the Mississippi have so many outlets. You can see the sand grains and shining scales of mica that roll and slip along at the bottom of our miniature river. Just so the sediment is carried down by a big river. See how the flow of sand has built up or pushed out this bank of earth, which is slowly filling up the still pool. The sand rolls along the river-bottom till it reaches the edge of the sunken bluff, then it stops. See how suddenly the water deepens around the outer edge of the delta. That is the way with the deltas of larger streams. A little while ago the main current ran through this longest outlet, which has pushed its bed furthest into the still water. But the further it got the slower the current became and the smaller the amount of sand carried to the end; the heavier particles came to rest in the river-bed, slowly raising it till it was higher than that of one of the shorter arms, then the main flow turned to the lower level. By and by the same thing will happen here, and then the channel will shift again; so the delta grows."

"Were these little sand-bluffs back from the water formed in the same way?"

"Very much the same. There was a sudden thaw a few weeks ago, and then this little stream was much larger than it is now. Then, too, there was a high bank of frozen snow or ice along the fence. I remember the pool that formed here was knee-deep at that time, and quite a torrent crossed the road, carrying a great deal of mud. All this space was filled with sand and mud up to the level of the tops of these bluffs. As the snow bank melted away the pool became broader and shallower, and the stream dug the valley out again, leaving these few terraces to show how it had once been filled up.

You will see just such bluffs and terraces along the Connecticut and many other rivers."

"I have seen pictures of them in my geography," said Fred. "I suppose they were just made so when the world was made."

"You will learn by and by that all these things have histories; nothing we see has always been what we see it now; and these terraces along the Connecticut tell just the same kind of a story as this that we are reading in this mud-puddle.

"Here's a bluff that tells a different story. The face of it shows that it was never any bigger than now; and you can see the channel of the little stream that brought the earth that forms the terrace down from the road. The stream dried up, then the pool it ran into was drained away, and the terrace is left as a memento of both."

"Here is another that tells still a different story. It was formed in the same way, but when the deep water was draining away, a little stream ran in the old river-bed, cutting a gorge through the higher terrace and using the earth to form another terrace, which has in turn been cut through. That reminds me of some of the pictures which Major Powell gives of canyons of the Upper Colorado."

"I never saw anything so interesting," Fred exclaimed enthusiastically; "it clears up ever so many things I never understood in the geography."

"Why! I can read them myself, now," he continued, passing on to the lower end of the puddle. "I should call this stream the Ganges. It looks just like the Ganges on the map. See, its branches are all on one side—toward this long stone heap covered with snow. I should call that the Himalayas, covered with glaciers. And this level space is the great plain of Bengal, where the famine was last Summer. Wasn't it a grand thing the English did, to save so many people from starving!"

"The grandest thing that England ever did," I replied, and I meant it.

"There's another river at the other end of our little sea," I went on. Does it remind you of any river you have read about?"

"It's like the Nile in running through a long strip of country without any tributaries," said Fred, getting off one of his big geography terms. "But the Nile has a Delta, and this one

hasn't, and the banks of the Nile are not so steep, at least in pictures."

"Why shouldn't this river have a delta?"

Fred examined the outlet carefully, then said, "I guess it is because the banks are so high it can't get out of its own channel."

"Yes," I replied; and the deepening channel shows that the level of the pool has sunk so much since the stream began to run in its present bed. The ice is melting rapidly by the fence, and by to-morrow our puddle will be gone. Then, if we have no rain in the meantime, you will see, not a lake with rivers running into it, but a dry valley hemmed in by hills and cut up by the beds of old water courses—a capital place for studying earth sculpture."

"I'm so glad we came to-day!" Fred replied earnestly.

"Notwithstanding it's the 1st of April?"

"Oh!" was the apologetic reply, "I didn't know how to study geography, this way, then."

"It's a good way, isn't it?"

"Tip-top. It makes everything as plain as if I had traveled all over the world to see all the rivers."

"*Some* things, you mean; remember you have just begun your geographical observations. Just imagine that you are a traveler in a new country determined to find out all about it, and how it compares with the countries you already know, and I promise you it will give you all the occupation you will have time for this Summer, and you won't miss your books, either. It is only people who walk blindly, not knowing or caring to see, that think any part of the great world stupid."

"I didn't know what I was saying when I said that," Fred replied.—*Christian Union.*

Talleyrand once complained that the English had thirty-nine religions and only one sauce, which evoked the retort from a witty Englishman, "And the French have thirty-nine sauces and no religion."

*THE USE AND ABUSE OF TEXT-BOOKS.

The last fifty years have witnessed as many changes in the management of schools, their methods of discipline, systems of instruction, the quantity and quality of intellectual pabulum administered to children, as in any other department in the whole realm of intellectual advancement. These changes have been established, sometimes through silent, sometimes through stormy, revolutions; and as all great growths are gradual, so reforms in school management have fought their way slowly, but surely, against conservatism, old-fogyism, and a thousand and one old-time prejudices, which would still apply the rod, teach the A, B, C method, scout the existence of High Schools, decry the languages, deride the arts as a means of discipline, and teach the children to regard the teacher as a tyrant, whose throne is a sceptred throne, whose power is absolute, and who wields the *birch* by the grace of God.

These reforms have been due to master spirits in the cause of education. Pestalozzi and his noble band of disciples, faithful and fervent as the Rhapsodists of the Homeric Age, have undermined the whole system of Primary and Intermediate Instruction; and while there are a few schools in the best cities of the United States which are standing on the new earth, under the new heavens, and making faithful progress, the rank and file are still moving amid the chaos of these educational earthquakes, and await master hands to guide them into more excellent ways. That our present theories are good, nearly all will readily admit; but that they are largely misunderstood, and in their practical use are fearfully mutilated, all will willingly acknowledge. We have some wheat, we have an abundance of tares. To sow good seed everywhere is one of the objects of an association like this. On the subject of text-books public opinion is still divided. There are those who would dispense with them altogether, and rely on the lecture system pure and simple. The arguments of such men may be sincere, but not wise; radical, but not rational.

Solomon's temple was built without the sound of hammer;

*Read before the Illinois State Teachers' Association, December, 1874, by Prof. A. F. Nightingale.

but it stands unique and alone. No other structure, whether in the physical, the intellectual, or moral world, was ever erected without the faithful and persistent application of appropriate utensils. Man's brain and man's brawn are the first causes, finitely speaking, which underlie all progress, all culture; but these without the voice to speak, the pen to write, the press to print; these without steam to be manipulated, the treasures of the earth to be disemboweled, God's lightning to be controlled, would be useless.

In all departments of art, science and literature, the artisan, the mechanic and the author, all need tools to work with that thought may be effective.

> "As unto the bow the cord is,
> So unto the man is woman,
> * * * Useless each without the other."

So in school matters—text-books, apparatus, and all the paraphernalia of an educational work-shop, are as essential to the highest success, as is the teacher who is to manipulate these tools, or the pupils upon whom they are to be manipulated.

The products of a carboniferous age are in the earth in a certain peculiar and somewhat heterogenous state, and it needs the application of science and the invention of appropriate machinery to develop, to bring to the surface, to separate and utilize these products, for man's consumption. So the Infinite architect has placed in every child's brain the germ of intellectual culture, which is to be developed, disciplined, educated, not by the teacher alone, but by a happy combination of the teacher's guiding, restraining, constraining, controlling power, and the application of the child's mind to philosophically arranged text-books, suited to his age and growth.

While I am radically and irrevocably opposed to the present outrageous abuse of text-books, good, bad and indifferent, in the hands of unskilled teachers, which every city, county and town, (perhaps I ought to except Chicago), is cursed with, yet I would not dispense with them altogether. But as some of them are, *I believe they will average with the teachers that use them.* "It is not in our stars but in ourselves that we are underlings." Failure in the school-room is not attributable so much to poor text-books, as to poor teachers who cannot distinguish between chaff and wheat, or if they can, still persist in cramming the

indigestible mixture down the child's throat, until after a while all the faculties of the mind, except memory, become discouraged, disheartened, benumbed, and fall asleep, while memory is goaded and lashed, and chastised and spurred on, driven at a break-neck, hap-hazard pace, "by the whips and scorpions" of senseless teachers, until at last the child becomes an intellectual dwarf, or a walking cyclopedia, going up and down the earth with infinite aims and toward unfruitful ends. That this is not true of those who adorn the profession, and their name is legion, all will admit; that it is emphatically true of those who, through the influence of piety, poverty or politics, are endured in our schools, none will deny. Kindergarten culture should precede for two or three years the introduction of those primary school methods which largely obtain in our country. The child from the age of three to seven needs no books to study; they are instruments of *torture* rather than of *training* through this period (Mill and Milton to the contrary, notwithstanding). The child is born an observant being. Nature develops these faculties first; and our schools should be planned on this basis, so that by the earliest discipline of the observing powers, the infant mind may be prepared for the easier and more rapid development of those other faculties which deal with abstruse subjects. The expense which would attend the universal attachment of Kindergarten schools to our public school system, would prove the highest economy in the more rapid and systematic development of mind in the later years of school culture, and I trust we are living in the dawn of that day, when they will be the pride of every mother, the boast of every town. When the child has attained to such culture, his mind becomes sufficiently active and skillful to demand something tangible to use, to look at, to read, to study, not as the be-all and end-all of his work, but as a complement to it, an aid in it, a sort of suggestive machine, by which the thoughts of the book give rise to thoughts in the brain, both of which are to be fashioned and systematized by the teacher, who is text-book over all. Now what is the office of the text-book? What is the office of the teacher?

Are our public schools accomplishing all they ought? I am going to look upon the darker side of this picture; I am going to cast blame where I think the blame belongs; not because

there is no bright side; not because our schools are not accomplishing a glorious work—far from it! To our public schools we must ever look for the maintenance of republican principles, and the supremacy and permanency of popular government. The children of liberty must all be rocked in her cradle, and her cradle is the public school. That our schools are infinitely superior to what they were twenty years ago, their bitterest enemies will acknowledge; that they are far from being what they ought to be consistent with money expended and material furnished, their most sanguine friends must admit.

Many condemn the text-books now in use and think them the secret of a want of success in our school system. I cannot appreciate this reasoning. I readily admit that it does seem as if some men who write text books forget their philosophy, and are ambitious only to provide wares that will sell in a cheap market; whose motives seems to be to *pile money* into their own coffers, rather than to accumulate *mind* in the country; and I know that publishers send out an army of agents, panoplied in armor, both *defensive and offensive, which reaches from the brain to the pocket;* agents who are as wise as serpents, and harmless as —lions, going up and down the country seeking whom they devour. But when the question is asked, "Are our text-books all bad?" I answer emphatically, no! Many of their authors are eminent; eminent teachers, eminent scholars, eminent philosophers. The argument that these men live in an atmosphere out of and above that of the child, where thought is rarified and metaphysical, is a false argument. These men have been practical teachers, successful teachers, sensible teachers. They have been in the school-room; they know its wants; they have taught children, they understand their capabilities; they have been and are students of mental philosophy; they know the subtle workings of this mystical power within, called mind; they can analyze its properties; they know the intellectual food in quality and quantity that the child needs through all the stages of its early and later developments. Our text-books, I say, are not all bad. If some are bad and some are good, why is it that both seem to share the same fate? Why is it that pupils studying the poor text-books seem to progress about as well as those who study the best ones? I cannot answer all these questions as fully as I would in the narrow scope of one

article, but I tell you, fellow teachers, it is we that are lacking; our minds are undeveloped, undisciplined, unskilled. It is we that cannot read the workings of the child's inner consciousness, and adapt means to ends. WE may chisel a life time upon a block of marble, and we shall only *hack, hack, hack,* and nothing more; but a Phidias will find the angel in the stone and bring it out. Our text-books are only blocks of marble, furnished from those grand old quarries which have given us some of our best philosophy, our highest art, our most advanced science—this marble, cold and stolid in itself, is to be chiseled and sculptured by the practical, skilled teacher, until the angel that is in it shall stand out and stretch her hands of benediction over the inspired child.

In point of discipline, the teacher is *in loco parentis,* but in point of instruction the text-book is NOT *in loco præceptoris.* If it were, what need of teachers, and schools and school-houses? Why all this lavish expenditure of the people's money? It costs more to support the public schools of the nation than anything else, except its drunkards.

Why not furnish each parent with a pile of text-books, and let him set his child down and measure off the lessons by the inch, the foot or the yard, and tell him to learn them. Will he whatever his application, become educated, developed, disciplined? Oh, no! Neither will he be, when sent to school, if the teacher becomes lost in the text-books. The text-book *per se* has little of life, little of inspiration, little of attraction in it. It must be culled, pruned, ornamented, beautified, explained, clothed with flesh and blood by the teacher. It is a a mere skeleton, dry bones, without form or comeliness, until the spirit of an inspired teacher is breathed upon it. To remedy these defects, not defects in the text-books, but in the instruction, certain teachers, practical and successful themselves, have sought to make others so by publishing text-books, containing their plans, methods, illustrations; text books, in fact, furnishing the precise language which teachers should use in the school-room. Such authors have unwisely supposed that because success followed these methods in their school, that they were to revolutionize entirely the instruction in this department by throwing out their methods and their exact language in the form of a text-book. But how insipid such books

are in the hands of pupils, and how utterly impossible it is for one teacher to use the precise methods, the same anecdotes, the identical language of another in the school-room. These methods may be almost perfect, so far as the author is concerned, but when used by him, they were original, they came from his brain, his mouth, his eyes, face, not from a book; and when they are transcribed upon the cold page of a text-book for others to use, and especially for pupils, they prove to be purgatives rather than tonics. There is a number of such books now surfeiting the market, and which are unfortunately being introduced into our schools, books which read well and which are excellent for young and inexperienced teachers to consult as reference books, as reservoirs from which to take draughts before going into the school-room, but which are absolutely injurious and out of place in the hands of pupils. They are not, or should not be, intended for pupils, but only for those teachers who must have some substitute for their own mental deficiencies. What is the meaning of all these new departures? It is, to my mind, a fruitless and unphilosophical attempt to make text-books that shall stand in the place of the teacher. It is an unwise and unholy plan to bolster up poor, inexperienced and unskilled teachers. Instead of going down to the foundation of things where the radical defect lies, and saying to every teacher, "*Unless you feel competent to teach this school, so far as mere instruction is concerned, without the aid of a single text-book, you cannot have the school*," we are trying to make text-books which shall at the same time serve the double purpose of furnishing instruction to both teacher and pupil. As well may we attempt to make "a fountain send forth at the same place sweet water and bitter." "Can the fig tree, my brethren, bear olive berries? either a vine, figs? So can no fountain, both yield salt water and fresh." What is intellectual food for the young pupil is not the nourishment which teachers need. There is much to condemn in text-books, but much more to condemn in teaching. *There is much twaddle published, but more twaddle elected to teach it.* Teachers lose sight of the the fact that the text-book is for the pupil, not for themselves. They have no business with a text-book during recitation. If as teachers we have not learned our lessons, and supplied ourselves with an abundance of material by way of illustration to

make the subjects discussed impressive, practical, what right have we to exact lessons from the pupils? The school text-book in arithmetic, geography, grammar, history, algebra, geometry, philosophy, zoology, botany, geology, chemistry, *et cetera*, should never be seen in the hands of the teachers during recitation. O! if this all pervading fault, this "sum of all villanies" in our schools, could be remedied to-morrow, what revolutions would take place in the name of education! What a rattling among the dry bones there would be! What decimations among teachers! How their ranks would be thinned! How the midnight oil would be burned! How our high schools, our colleges, our normal schools, not as many of them are, but as they all ought to be, would be filled with earnest young men and women, determined to be educated before they attempted to educate, to be instructed before they attempted to instruct, to be disciplined before they attempted to produce it, to develop their own brains, before they attempted to be the architect of the brains of another generation; how foolish girls, calling themselves teachers, would cease courting the three f's, flirtation, frivolity and fashion, and study more assidiously the three r s, "reading, riting and rithmetic," and how young men, instead of accepting positions at $30 or $40 per month, which is just $30 or $40 more than they are worth, would struggle for an education, which would make salaries higher, and their work commensurate with their pay. The schools of St. Louis (if I dare say anything in Chicago in praise of that city), already have such a regulation. I know not whether it is a dead letter, but it ought to be the most stringently enforced rule in the whole code of practical school laws.

(CONCLUDED NEXT MONTH.)

EARLY NORMAL SCHOOLS, AND THEIR TEACHERS.—The original movement in behalf of Normal Schools in this country was a grand step. It was conducted by men of power and of culture. Fine abilities, thorough and extended scholarship, indomitable industry, a glowing enthusiasm, and an unruffled moral courage; these were the qualities that gave the movement success. Some of these men, though possessing many elements of greatness, are at present little known by their names, but they are known by the fruit of their deeds. They were content to labor, and left the talking to others.

READING BUT NOT UNDERSTANDING.—Some one has very appropriately said that Americans are a nation of voluminous but superficial readers. Not one in ten who read plain English sentences comprehend or could properly express the exact idea intended in what is written. This, to the fullest extent, is true of the pupils in our schools, and many, too many, of the teachers. Pupils are too seldom required to express in their own language the meaning of a plain sentence. Classes in our schools should be specially exercised in reading and analyzing the ideas in simple sentences. This matter is a thousand fold more important than many other things which consume the time of our pupils.

CENTENNIAL—A QUEER DOCUMENT.—The Norfolk, Va., *Landmark* has received a copy of the *Maryland Journal and Baltimore Advertiser*, published May 17th, 1775, and in it is published the following advertisement:

WINCHESTER, VA., April 27, 1775.

There is now confined in Winchester prison for debt, a young man who is capable to teach school, and understands arithmetic, geometry, surveying, quaying, navigation, algebra, astronomy and bookkeeping, as he received his education at some of the principal schools of England and Ireland, with five years study in T. C. Dublin and Edinburg. He is perfect master of the mathematics. He would now willingly engage with any gentleman to teach school in consideration of their discharging the debt for which he is confined, in consequence of which he will sign an indenture for three years. The demands of his creditors are the present payment of 21 pounds, 10 shillings, and in two years the further payment of 21 pounds, 12 shillings, Virginia currency. Those gentlemen who have children are requested to consider the great advantage of having a proper person to instruct them, and the very small expense attending the same on the above terms. For further particulars apply to George Roots, Esq., lawyer, Winchester, Virginia.

DEPARTMENT OF PUBLIC INSTRUCTION.

THE STATE BOARD OF EDUCATION

Met at the office of the Superintendent of Public Instruction, June 1, 1875, at 3 o'clock P. M.

Present—Governor Pacheco and Messrs. Allen, Crawford, Denman, Kelly, Kennedy, Lynch and Bolander.

Absent—Mr. McMeans.

Governor Pacheco in the chair.

The minutes of the meeting held January 5, 1875, were read in part.

On motion of Mr. Allen, his statement in reference to the cost of a change of text-books, submitted at the last meeting, was ordered to be entered on the minutes of said meeting.

The further reading of the minutes was then postponed.

Mr. Crawford rose to a question of privilege, for the purpose of denying that he had been improperly influenced, or had tried himself to influence other members of the Board, relative to the adoption of text-books.

Mr. Bolander rose to a question of privilege in order to explain why he had sent out notices postponing the meeting of the Board, after having called it for the first of June. He read the following letter, from which it will be seen that the meeting was postponed at the request of Mr. McMeans, and in order to accommodate those members of the Board who are County Superintendents and as such expected to preside at the teachers' examination:

OFFICE OF THE SUPERINTENDENT OF PUBLIC SCHOOLS,
Santa Rosa, Sonoma County, California, May 25, 1875.

J. HENRY EICKHOFF—Dear Sir:—I have just received the notice, calling for a meeting of the State Board, on Tuesday, June 1. I am surprised at its being called for that day, for you are aware that the quarterly examination will comme ce Wednesday, June 2. Is it *possible* for you to postpone the meeting for one week? I saw Mr. Bolander this evening as he passed through. He will not object to a postponement. He says that he did not think of the June examinations when he set the time for the meeting of the State Board. If it is possible to postpone, please do so, as it will be *utterly impossible* for me to be in Sacramento June 1st, in consequence of the examination which is to occur, as I have before stated, June 2d.

Yours truly, A. C. MCMEANS,
County Superintendent.

On recommendation of the State Board of Examination, Life Diplomas were granted to

Miss Elizabeth Powell, Alameda Co.
Miss Nellie E. Walsh, Alameda Co.
Mrs. N. D. Standeford, Alameda Co.
H. C. Higby, Fresno Co.
Converse Howe, Los Angeles Co.
Geo. H. Peck, Los Angeles Co.
B. J. Watson, Nevada Co.
Miss S. M. Gunn, San Diego Co.
Miss Carrie P. Field, San Francisco.
Miss Jane E. Greer, San Francisco.
Miss Julia B. Short, San Francisco.
James K. Wilson, San Francisco.
Miss Helen A. Grant, San Francisco.
Miss Mary M. Murphy, San Francisco.
Miss Fannie M. Sherman, San Francisco.
Irving P. Henning, Santa Clara Co.
William Crowshurt, Solano Co.
Mrs. Eliza F. Middleton, Sonoma Co.
Mrs. Janette E. Woodworth, Sonoma Co.
M. C. Clark, Sutter Co.
F. S. S. Buckman, Ventura Co.

The matter of the subscription to the CALIFORNIA TEACHER for the number of copies required by Section 1729 of the Political Code, was, after some debate, referred to a special committee of three, to be appointed by the Chair.

Messrs. Allen, Denman and Bolander, were appointed as such committee.

Professor Allen offered the following resolutions:

Resolved, That a change is hereby proposed by this Board in regard to that certain series of text books designated as McGuffey's Eclectic Series of Readers, heretofore adopted by this Board, which adoption took effect on the first day of June, 1875; whereby, and by virtue of such change (if made), a new series of Readers shall be adopted in place of said McGuffey's Series, and that the question of the making such proposed change shall be considered and determined by this Board, at a meeting thereof, to be held at Sacramento, on the third (3d) day of December, 1875, at 10 o'clock A. M.

Resolved further, That a change is hereby proposed by this Board in regard to that certain series of text books designated as Monteith's Geographies, heretofore adopted by this Board, which adoption took effect on the first day of June, 1871; whereby, and by virtue of which change (if made), a new series of Geographies shall be adopted in place of said Monteith's Series, and that the question of the making of such proposed change shall be considered and determined by this Board, at a meeting thereof, to be held at Sacramento, on the third day of December, 1875, at 10 o'clock A. M.

Resolved further, That a change is hereby proposed by this Board in regard to that certain series of text books designated as Robinson's Series of Arithmetics heretofore adopted by this Board, which adoption took effect on the first day of June, 1871; whereby and by virtue of which change (if made), a new series of Arithmetics shall be adopted in place of said Robinson's Series, and that the question of the making such proposed change shall be considered and determined by this Board, at a meeting thereof, to be held at Sacramento, on the third (3d) day of December, 1875, at 10 o'clock A. M.

Resolved further, That a change is hereby proposed by this Board in regard to that certain series of text books designated as Brown's Grammars, heretofore adopted by this Board, which adoption took effect on the first day of June, 1871; whereby, and by virtue of which change (if made), a new series of Grammars shall be adopted in place of said Brown's Series, and that the question of the making such proposed change shall be considered and determined by this Board, at a meeting thereof, to be held at Sacramento, on the third (3d) day of December 1875, at 10 o'clock, A. M.

Resolved further, That it is hereby proposed by this Board to adopt text books in the following branches of study, viz: Penmanship, Orthography, Physiology, Natural History, Natural Philosophy, Elements of Form, Vocal Music and Industrial Drawing; and that the question of the adoption of such text books shall be considered and determined by this Board, at a meeting thereof, to be held at Sacramento, on the third (3d) day of December, 1875, at 10 o'clock A. M.

Resolved further, That all publishers of text books, of the character specified in the foregoing resolutions, are invited to submit proposals for supplying such required text books, or such text books as may be required for the proposed changes or adoptions, if made. Said proposals to be submitted on or before 10 o'clock A. M., of the third (3d) day of December, 1875, at the office of the State Superintendent of Public Instruction, at Sacramento, and to be accompanied by sample copies of the books proposed to be furnished, together with a statement of the retail price at which the books will be sold in this State for the full term for which the books are adopted.

Resolved further, That James Denman, Henry N. Bolander, and Dr. G. R. Kelley be, and are hereby appointed a special committee, to give six months' public notice of said proposed changes and adoptions of text books, and of the foregoing resolutions, on behalf and as the act of this Board, which notice shall be published three times consecutively, in two newspapers of this State—one of the City and County of San Francisco, to wit, the *Daily Evening Post*, and the other of the City of Sacramento, to wit, the *Daily Sacramento Record-Union*;

and said committee are also hereby directed to preserve the evidence of said publication, and place the same in the files and records of the Board, and are also authorized to do all other acts necessary in this behalf.

Resolved, That when this Board adjourns it adjourn to meet on the third (3d) day of December, 1875, at the hour of 10 o'clock A. M., at the office of the State Superintendent of Public Instruction, in the City of Sacramento, California.

After a protracted discussion of the resolutions, the Board, without taking any action, adjourned till 8 o'clock P. M.

EVENING SESSION.

The Board met according to adjournment, same members present as at the afternoon session.

Consideration of the resolutions offered by Mr. Allen was resumed. After a long discussion, Mr. Bolander moved to postpone action until the 22d of June, meanwhile every member to have a copy of the resolution furnished him.

The motion was lost:

Ayes—Messrs. Crawford, Lynch and Bolander.

Noes—Messrs. Allen, Denman, Kelley, Kennedy and Governor Pacheco.

The motion to adopt the first resolution was then carried:

Ayes—Messrs. Allen, Denman, Kelley, Kennedy, Lynch and Gov. Pacheco.

Noes—Messrs. Crawford and Bolander.

The second resolution was thereupon adopted as follows:

Ayes—Messrs. Allen, Denman, Kelley, Kennedy, Lynch and Gov. Pacheco.

No—Mr. Crawford.

Mr. Bolander was excused from voting.

The remaining resolutions were adopted by the following vote:

Ayes—Messrs. Allen, Lynch, Kelley and Kennedy.

Noes—Messrs. Crawford and Bolander.

The matter of the subscription of the CALIFORNIA TEACHER was then taken up. The special committee made its report; and on motion of Mr. Allen, it was resolved that the Board authorize the Superintendent of Public Instruction, in accordance with the provisions of Sections 1726 and 1731, of the Political Code, to subscribe for 3,104 copies of the CALIFORNIA TEACHER, at $1.25 per annum for each copy.

No further business appearing, the Board adjourned at 10:35 P. M.

HENRY N. BOLANDER, Secretary.

LIST OF DIPLOMAS AND CERTIFICATES granted from February 8, 1875, to June 7, 1875. The date immediately following the name gives the time of the expiration of the diploma or certificate:

Educational Diplomas.

Alderson, Miss M. J, May 17, 1881.
Ashton, Mrs. N. Jennie, March 22, 1881.
Ayers, Mary J., March 22, 1881.
Bonnard, Miss Eureka A., May 17, 1881.
Boynton, Mrs. Kate, May 31, 1881.
Brumsley, Miss M. L., April 10, 1881.
Campbell, Amy T., March 13, 1881.
Ciprico, Miss Anita C., Feb. 8, 1881.
Cory, Miss A. A., April 10, 1881.
De Nure, D. D., May 31, 1881.
Edwards, W. H., February 8, 1881.
Fowler, B. F., May 17, 1881.
Furlong, Robert, March 13, 1881.
Geer, Emily F., June 7, 1881.

Educational Diplomas.—Continued.

Gray, Miss Annie L., May 31, 1881.
Haislip, Benj. F., June 7, 1881.
Hall, Miss F. M., February 8, 1881.
Hamilton, Rev. Hiram, June 7, 1881.
Keegan, Miss Mary A., April 10, 1881.
Knowlton, E. L., April 10, 1881.
Kratzer, Miss Lella, May 17, 1881.
Miles, Mrs. R. S., June 7, 1881.
Montgomery, Miss A. S., May 17, 1881.
Pedler, F. A., March 13, 1881.
Royall, J. P., March 13, 1881.
Saunders, Samuel, March 13, 1881.
Saxon, T. A., March 13, 1881.
Standeford, Mrs. N. D., March 13, 1881.
Stincen, Emma E. C., March 22, 1881.
Taylor, Mrs. H. P., May 17, 1881.
Thompson, Miss Louisa, March 13, 1881.
Wells, Jos. H., February 8, 1881.
Wenk, Robert E., February 8, 1881.
White, Mrs. Sara, April 10, 1881.
Wilson, H. C., March 13, 1881.

First Grade Certificates.

Ambrose, Warren B., May 31, 1879.
Bateman, Henry, March, 26, 1879.
Barnes, Miss Eliza B., April 10, 1879.
Barnes, Emmogene A., March 26, 1879.
Beal, Chas. R., May 31, 1879.
Bodwell, Miss L. B., April 10, 1879.
Bradnu, Mattie F., May 17, 1879.
Brooks, Elisha, April 10, 1879.
Buckley, Emma S., March 26, 1879.
Burt, Minnie Clara, March 26, 1879.
Carr, Mary E., March 26, 1879.
Carrau, Celina R., Feb. 8, 1879.
Clarke, Charlotte K., March 26, 1879.
Colby, Mrs. Mary A., May 17, 1879.
Cole, Marie, March 26, 1879.
Cory, Nellie, April 10, 1879.
Cowie, Annie B., March 26, 1879.
Dame, Miss Mary L., June 7, 1879.
Davies, Abbie A., March 26, 1879.
Day, F. H., March 13, 1879.
Dixon, Bessie, March 26, 1879.
Ensign, Sarah Jane, March 13, 1879.
Fagg, Belle, March 26, 1879.
Farmer, Fannie, March 26, 1879.
Farnham, Chas. E., March 26, 1879.
Farnsworth, Julia B., March 26, 1879.
Field, Miss Sarah, Feb. 8, 1879.
Gilmor, Harriet N., March 26, 1879.
Hanck, Julia L., March 26, 1879.
Hannah, H. O., April 28, 1879.
Hanscom, Nathan C., March 26, 1879.
Harkness, Geo. S., Jr., April 10, 1879.
Hartson, Iola S., April 10, 1879.
Haskins, Miss Harriet, March 13, 1879.
Heath, Alice, March 26, 1879.
Henning, David F., March 26, 1879.
Hollenbeck, Minnie B., March 26, 1879.
Hollingsworth, Maria, April 10, 1879.
Howard, Millie S., March 26, 1879.
Howe, Alvin Jared, March 22, 1879.
Intermille, Rosina, March 26, 1879.
Janvier, Allen E., April 10, 1879.
Jewett, Annie S., Feb. 8, 1879.
Jones, Nellie R., March 26, 1879.
Kraus, Emma F., April 10, 1879.
Kraus, Sophia M. F., April 18, 1879.
Leahy, Mary A., March 26, 1879.
Lewis, Mary, March 26, 1879.
Little, David F., March 26, 1879.
Littlefield, Miss N. A., May 17, 1879.
Martin, Amelius F., May 17, 1879.
Martin, Kate Nelson, March 26, 1879.
May, Isabel, March 26, 1879.
McDonald, Mary, March 26, 1879.
McKown, Mrs. M. E., May 17, 1879.
Menges, Caroline A., June 7, 1879.
Moore, Mrs. M. E., Feb. 8, 1879.
Morey, Sabra E., March 26, 1879.
Morgan, Rose E., April 28, 1879.
Neary, Annie J., March 26, 1879.
Ogilvie, Charlotte A., Feb. 8, 1879.
O'Brien, Miss Kate, March 22, 1879.
Pascoe, Wm., Jr., March 26, 1879.
Pelton, Malvina Chase, April 10, 1879.
Phelps, Augusta M., March 13, 1879.
Pratt, Alexis L., March 22, 1879.
Root, Ellis J., March 26, 1879.
Sargent, Lizzie, March 26, 1879.
Scheuck, Emma, March 26, 1879.
Seaman, Edward M., May 17, 1879.
Shearer, Flora M., April 10, 1879.
Shirley, Jas. W., March 26, 1879.
Silliman, C. H., May 31, 1879.
Stockton, Adelia A., March 26, 1879.
Stone, Henrietta, April 10, 1879.
Toy, Emma, March 26, 1879.
Turner, Belle J., March 26, 1879.
Watkins, Florence M., March 26, 1879.
Weeks, M. L., May 31, 1879.
Webb, Mrs. M. E. W., May 17, 1879.
Wells, Alice M., March 26, 1879.
Wheaton, Miss Clara, April 10, 1879.
White, Mattie H., April 10, 1879.
Wible, Anna A., March 26, 1879.
Wible, Julia F., March 26, 1879.
Wilson, Mrs. E. A., April 10, 1879.
Wilson, Mary E., March 26, 1879.
Wilson, Wm. R., March 26, 1879.

Second Grade Certificates.

Armor, Mrs. A. L., April 10, 1878.
Bodwell, Etta M., April 10, 1878.
Bonnard, Helen A., April 10, 1878.
Burscough, Lizzie, April 10, 1878.
Cahill, Thos. E., April 10, 1878.
Clapp, Fronie T., April 10, 1878.
Colman, Mrs. D. M., April 10, 1878.
Crawford, Alonzo, April 10, 1878.
Dickinson, Marie T., April 10, 1878.
Gates, Mrs. Sophia B., April 10, 1878.
Hankenson, Jno. B , March 13, 1878.
Hinkelbein, Josephine, April 10, 1878.
Jones, Newman, April 10, 1878.
Lynch, Wm. Francis, April 10, 1878.
Martin, Miss Ada, April 10, 1878.
Miller, Miss C. E., April 10, 1878.
Ray, Maria, April 10, 1878.
Smith, Jas., April 10, 1878.
Wild, Mrs. Maggie H., April 10, 1878.

Third Grade Certificates.

Banks, Lily, April 10, 1877.
Chesnutwood, Lizzie H., April 10, 1877.
Gilman, Lucie A., April 10, 1877.
Haslam, Susie E., April 10, 1877.
Madden, Jennie L., April 10, 1877.
Murphy, Miss Nellie, April 10, 1877.
Richardson, Irene, April 10, 1877.
Salsig, Alice A., April 10, 1877.
Sherman, Miss Julia E., April 10, 1877.
Smith, Belle, April 10, 1877.
Trimble, Caroline, April 10, 1877.
Valleau, Sophie, April 10, 1877.

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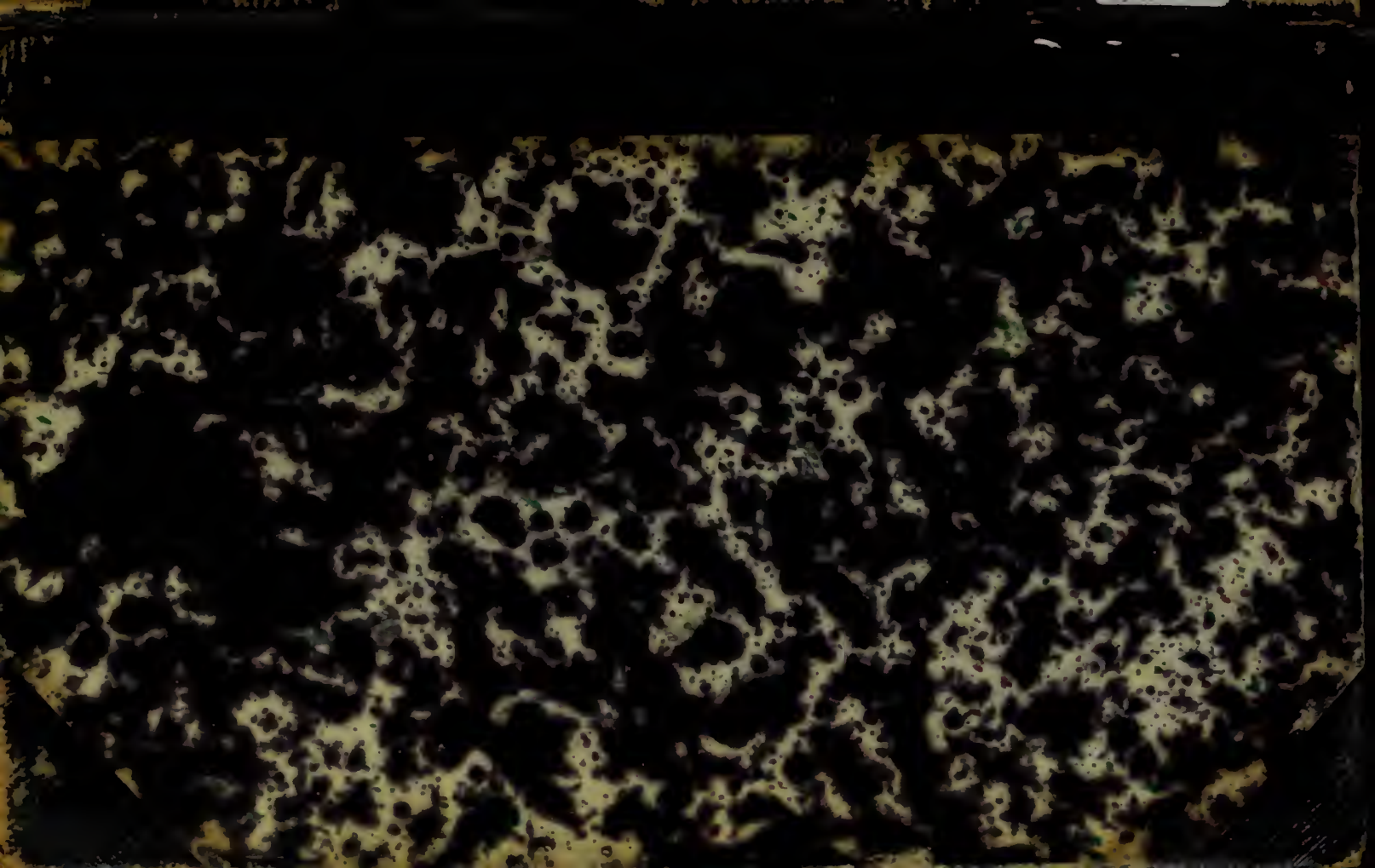
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